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BARRIERS TO FULLY IMPLEMENTING INTEGRATED LOGISTICS SUPPORT (ILS) IN SYSTEM ACQUISITION AS PERCEIVED BY ILS MANAGERS AND PROGRAM MANAGERS AT THE AERONAUTICAL SYSTEMS DIVISION

John R. Hull, Major, USAF
Gregory L. Lockhart, Captain, USAF

LSSR 36-82

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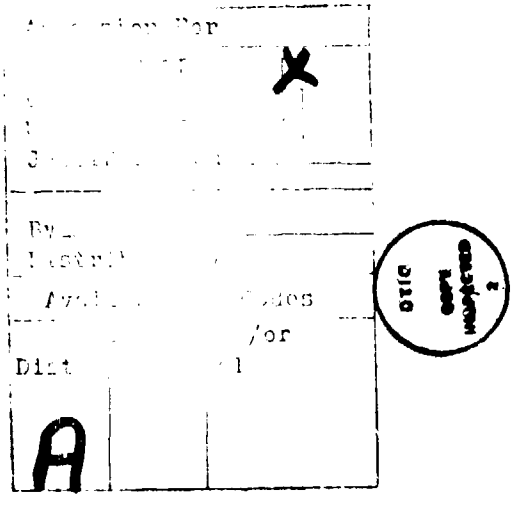

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REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER LSSR 36-82	2. GOVT ACCESSION NO. AD-A122 999	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) BARRIERS TO FULLY IMPLEMENTING INTEGRATED LOGISTICS SUPPORT (ILS) IN SYSTEM ACQUISITION AS PERCEIVED BY ILS MANAGERS AND PROGRAM MANAGERS AT THE AERONAUTICAL SYSTEMS DIVISION		5. TYPE OF REPORT & PERIOD COVERED Master's thesis 6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s) John R. Hull, Major, USAF Gregory L. Lockhart, Captain, USAF		8. CONTRACT OR GRANT NUMBER(s)
9. PERFORMING ORGANIZATION NAME AND ADDRESS School of Systems and Logistics Air Force Institute of Technology, WPAFB OH		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
11. CONTROLLING OFFICE NAME AND ADDRESS Department of Communication and Humanities AFIT/LSH, WPAFB OH 45433		12. REPORT DATE September 1982 13. NUMBER OF PAGES 147
14. MONITORING AGENCY NAME & ADDRESS(if different from Controlling Office)		15. SECURITY CLASS. (of this report) UNCLASSIFIED 15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

16. DISTRIBUTION STATEMENT (of this Report)

Approved for public release; distribution unlimited

17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)

18. SUPPLEMENTARY NOTES

Lynn E. WOLAVER
Dean for Research and
Professional Development

APPROVED FOR PUBLIC RELEASE: IAW AFR 190-17
AIR FORCE INSTITUTE OF TECHNOLOGY (ATC)
WRIGHT-PATTERSON AFB, OH 45433
8 OCT 1982

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

Integrated Logistics Support (ILS)
Acquisition Logistics
Program/Project Management
Aeronautic Systems Acquisition
Readiness

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

Thesis Chairman: Dr. William B. Askren

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One of the "Carlucci Initiatives" is to improve readiness through designed-in reliability, maintainability, and supportability in system acquisition. The vehicle for incorporating supportability in design is ILS. There is a perception that programs continue to be structured to give top priority to cost, schedule, and performance objectives, at the expense of logistics concerns. The researchers developed a list of eight "barriers" which possibly explain the lack of consideration given ILS. The purposes of the research were to: 1) determine the relative importance of the barriers as perceived by program managers and ILS managers, and 2) determine if the two groups perceived the significance of the barriers differently. From the results of interviews with 82 managers, the researchers found substantial uniformity in perceptions between groups on the significance of the barriers. The two groups agreed that the most significant barriers to ILS are inadequate definition of logistics design parameters, and subordination of logistics concerns to cost and schedule objectives. The program managers felt the lack of acquisition skills among logisticians is third most significant, while the ILS managers felt their lack of authority within the program office is the third barrier to ILS.

LSSR 36-82

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A Thesis

Presented to the Faculty of the School of Systems and Logistics

of the Air Force Institute of Technology

Air University

In Partial Fulfillment of the Requirement for the

Degree of Master of Science in Systems Management

By

John R. Hull, BS
Major, USAF

Gregory L. Lockhart, BS
Captain, USAF

September 1982

This thesis, written by

Major John R. Hull

and

Captain Gregory L. Lockhart

has been accepted by the undersigned on behalf of the faculty of the School of Systems and Logistics in partial fulfillment of the requirements for the degree of

MASTER OF SCIENCE IN SYSTEMS MANAGEMENT

DATE: 29 September 1982

William B Askren
COMMITTEE CHAIRMAN

Ronald G Blackledge
FACULTY READER

ACKNOWLEDGMENTS

We wish to thank our thesis advisor, Dr. William B. Askren of the AFHRL, for sponsoring the research, and especially for the courtesy he has shown us during the last year. We hope he offers to sponsor other theses efforts, and we encourage future AFIT students to consult him for topics and advice.

Thanks also to Lieutenant Colonel Ronald Blackledge of the AFIT faculty for being a reader for our research. Colonel Blackledge offered welcome guidance on structuring the research, and applied the right doses of "wire brushing" to keep us on our toes.

Two other individuals deserve our appreciation for their help in developing the research methodology. Thanks to Mr. Ron Mutzelberg of the AFALD staff, and to Lieutenant Colonel James Dunne of the AFIT School of Engineering.

Finally, thanks to all the program managers of the ASD and the DPMLs of the AFALD who submitted to interviews that ranged up to two hours. We were shown utmost cooperation and courtesy from the top acquisition and logistics managers at the ASD. Thank you, ladies and gentlemen.

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PROBLEM STATEMENT

Background

Introduction

After a 1981 assessment of the defense acquisition process, Assistant Secretary of Defense Dr. Frank C. Carlucci issued a memorandum outlining changes that the Secretary of Defense intended to implement to improve the acquisition process. He affirmed eight major acquisition management principles as the basis for the recommended changes. One of the eight principles as stated was:

> Improved readiness is a primary objective of the acquisition process of comparable importance to reduced cost or reduced acquisition time. Resources to achieve readiness will receive the same emphasis as those required to achieve schedule or performance objectives. Include from the start of weapon system programs designed-in reliability, maintainability, and support [9:1].

It has been recognized for some time that the integration of logistics elements into the overall acquisition process is desirable, as evidenced by the amount of documentation concerning Integrated Logistics Support (ILS) and some of the tools designed to assist the ILS effort (such as Life-Cycle (LCC) Cost models and Logistics Support Analysis (LSA)). Thus, the idea of including logistics concerns in the design of a weapon system is not new. If the concept of ILS is, in

fact, accepted as an important part of the design of weapons systems, what are the barriers that prevent ILS from operating efficiently?

The Acquisition Improvement Task Force, formed by the Services to respond to the Carlucci initiatives, found that despite the amount of emphasis surrounding such concepts as ILS, LSA, and LCC, support considerations remain subject to a lack of management priority by the acquisition community. The Task Force states:

> The perception at all levels in the acquisition community is that there has not been a substantial shift in traditional priorities. As a result, programs continue to be structured to give top priorities to cost, schedule, and performance objectives; support and readiness considerations are left to be accommodated within these program constraints [21: 9-2].

In an effort to introduce balance among these objectives, Dr. Carlucci directed the Services to establish whatever guidelines necessary to insure that support and readiness considerations are given the appropriate priority during design. However, to establish support considerations on an equal footing with cost, schedule, and performance criteria, the services must identify, and then remove or reduce the major barriers to effectively implementing ILS. Success in removing any such barriers is dependent upon first achieving agreement among those involved in the acquisition process as to what the barriers are. Because of the different perspectives and sometimes divergent goals of the two major participants in the aeronautical system acquisition process

(Aeronautical Systems Division (ASD) of the Air Force Systems Command (AFSC) and Air Force Acquisition Logistics Division (AFALD) of the Air Force Logistics Command (AFLC)), agreement on the barriers and their impacts cannot be assured.

Research Problem

There has been no empirical research attempting to determine whether the two major participants in the aeronautical system acquisition process (ASD and AFALD) perceive the same factors as being the significant barriers to the effective implementation of ILS. Research is necessary to accurately identify those mutually agreed-upon barriers as a first step in removing them, and also note those where the perceptions of the participants differ. Without a common understanding of the sources of the problems in fully implementing ILS in the acquisition process, actions to remove or reduce a perceived barrier for one organization may serve to impose new barriers or increase the effects of existing barriers from the point of view of the other organization.

The researchers assumed that the concern over supportability issues exhibited by the Secretary of Defense is sufficient cause to judge that ILS is not being implemented as effectively as desired. It is not the purpose of this paper to demonstrate "failings" of ILS.

Historical Perspective

A brief examination of the history of weapon system acquisition in the air Force will help illustrate the

development of the two different perspectives of acquisition management presumed to exist for the purposes of this research. Following WWII, the United States military experienced a typical post-war demobilization and the "tight" budget that went along with it. The lack of military money created a situation where the available funds could barely support the forces-in-being, and most long-term research and development (R&D) was heavily restricted. The period was also characterized by questions about which organization should control R&D functions (6:8). By the late 1940's the aerospace scientific community voiced strong concern that the lack of adequate resources and management for long-term R&D would spell disaster for the future defense of the nation (29:3-4).

The findings of two separate Air Force committees (the Ridenour and Anderson Committees) supported the scientists' concerns. The committees urged that more resources be devoted to Air Force-directed research, and recommended creation of a research and development organization whose goals would be the development of superior weapon systems through long-term projects. Following the committees' recommendations, the Defense Department formed the Air Research and Development Command (ARDC) in 1951 and gave the new command primary responsibility for research, development, and engineering of new weapon systems, along with control of funds adequate to do the job (29:4). Thus, the logistics managers (Air Material Command), though retaining control of most of the monies, now had to share their authority over the acquisition

process with the new command. The ARDC controlled projects through development and the AMC took over when production began. Joint project offices composed of personnel from both commands managed the system acquisition, and the resulting condition of divided authority was a constant problem. The complexity of weapon systems had increased so much that ". . . no clear break-point between development and production was evident [6:7-8]." Exactly who was responsible for which action was open to constant interpretation and debate when problems arose or a decision had to be made.

The Air Force acquisition process continued to experience growing pains through the 1950's. Then towards the end of the decade, more emphasis was placed on R&D primarily because of the rapid technological expansion brought about by the Soviet launch of Sputnik. Consequently, the logistics community's control over acquisition of systems eroded further. In 1961 Secretary of Defense Robert McNamara ordered the creation of the Air Force Systems Command, which would control the development process up through the point that the system entered the operational inventory. Assigning the responsibility for the entire acquisition process under one command had been recommended more than once throughout the evolution of the process as a more effective way of managing and controlling weapon system acquisition. However, Mr. McNamara did not attempt to assimilate the logistics community's concerns into the acquisition process. Thus the logisticians were now effectively out of the picture until

the system was fielded, and the differences between the two commands grew even wider.

Developments during the last decade, such as the creation of AFALD, and more recently, Dr. Carlucci's initiatives to improve readiness and supportability, may indicate a shift toward more effective integration of these two viewpoints in an attempt to improve the acquisition process. Currently, the organizational structure of the acquisition system is in the midst of another significant change (specifically, the new Deputy Chief of Staff for Acquisition Logistics (DCS/AL) at HQ AFSC) that seems to be attempting to assimilate the logistics concerns more completely into the process (23:1).

The two different perspectives of the acquisition process exist today because of the particular circumstances involved in the evolution of Air Force weapon system acquisition management. No evaluation of the acquisition process and its problems would be complete without analyzing the effects of these two distinct viewpoints. The two different perspectives embodied in the development community and the logistics community can logically be extended to the action agencies in the acquisition process, as the next chapter will explain. The potentially different perceptions of the barriers to fully implementing ILS (and supportability) form the argument around which the research objectives were developed.

Research Objectives

The objective of this research is two-fold.

1. First, it is to investigate the significance of selected barriers to fully implementing ILS in aeronautical systems acquisition as perceived by two primary agents in the acquisition process: program (or project) managers within the Aeronautical Systems Division of AFSC, and ILS managers within the Air Force Acquisition Logistics Division of AFLC. To accomplish this objective, the researchers established three subordinate objectives to:

A. Determine if each of the selected barriers is perceived as having equal significance by ASD program or project managers, and AFALD ILS managers or specialists (perceptions between Divisions).

B. Determine if each of the selected barriers is perceived as having equal significance by program managers at the program office management organizational level in ASD, and subordinate level program/project managers in ASD (perceptions within the ASD).

C. Determine if each of the selected barriers is perceived as having equal significance by logistics managers at the program management organizational level of responsibility in the AFALD, and subordinate level logistics managers in the AFALD (perceptions within the AFALD).

2. A second objective is to determine the relative significance (rank-order) of the selected barriers to fully implementing ILS in aeronautical systems acquisition as perceived by ASD program and project managers and to compare them to the relative significance attached by logistics managers in the AFALD.

Research Hypotheses

1. The perceptions of the significance of selected barriers to fully implementing ILS in aeronautical systems acquisition differ between ASD program/project managers and AFALD logistics managers (supports Research Objective 1-A).

2. The perceptions of the significance of the selected barriers to fully implementing ILS in aeronautical systems acquisition are uniform between organizational levels within the ASD (supports Research Objective 1-B).

3. The perceptions of the significance of the selected barriers to fully implementing ILS in aeronautical systems acquisition are uniform between organizational levels within the AFALD (supports Research Objective 1-C).

Research Question

What is the rank-order of the significance of the selected barriers to ILS as rated by the ASD managers and as rated by the AFALD managers, and how do they compare (supports Research Objective 2)?

CHAPTER II

LITERATURE REVIEW

Introduction

The System Program Office

Possible perceptual differences between acquisition and logistics management personnel could have developed from the changing roles and responsibilities of the logistics community in the years following WWII. This chapter describes the system program office (SPO) as the entity in which system acquisition is carried out, and extends the differences in perspective to the working level. This is the level at which the concerns of logistics are integrated with the actual system design, and the level at which the "barriers" to ILS are confronted on a day-to-day basis. Since this research focuses on the SPO as the implementing organization for system acquisition, and on the program manager and the logistics manager as the principals in the acquisition process, it will be necessary to define some terms and relationships in the SPO environment. With the SPO as a background, the literature review will explore some potential "barriers" to fully incorporating ILS which are currently receiving attention in the face of initiatives to improve the acquisition process.

Terms and Relationships

Some terms and organizational relationships must be explained. These relate to the ILS function, its interfaces with systems engineering, the managers responsible for the implementation of each, and the environment within which these functions and their managers operate. Integrated Logistic Support is

> . . . a composite of all the support considerations necessary to assure the effective and economical support of a system for its life cycle. It is an integral part of all other aspects of system acquisition and operation [36:2].

Within the SPO, the ILS function provides recommended support parameters for the logistic elements and "qualitative and quantitative maintainability and reliability inputs to the design process [7:19]." The ILS function provides these inputs to the overall systems engineering effort. Both ILS and systems engineering are elements of Air Force engineering management, which is the

> . . . management of the engineering and technical effort required to transform a military requirement into an operational system. It includes the system engineering required to define the system performance parameters and preferred system configuration to satisfy the requirement, the planning and control of technical program tasks, integration of the engineering specialties, and the management of a totally integrated effort of design engineering, specialty engineering, test engineering, logistics engineering, and production engineering to meet cost, technical performance, and schedule objectives [35:3].

Engineering Management, along with the development of acquisition strategies and eventually the procurement of systems to meet "operational needs" has been within the

purview of the Air Force Systems Command (AFSC) since 1961. AFSC is differentiated into "product divisions," each responsible for a broad category of systems. The Aeronautical Systems Division (ASD) is one of the product divisions. The SPO is the organizational entity within the product division where system acquisition is managed. The SPO is organized along program management lines. Program management is a

> . . . special approach to management. It overlays the functional management structure and enhances communications, coordination, and control. Program management focuses on the achievement of an end product [3:p. 20-1].

The program manager (PM) is the executive responsible for all phases and functions described by "system acquisition." Within the program office, functional specialty offices are integrated to perform the varied functions essential to acquisition. Among these functional specialty offices is the Integrated Logistic Support Office (ILSO). The Deputy Program Manager for Logistics (DPML) is the manager responsible for ILS throughout the acquisition cycle. The DPML, also called the ILS manager (ILSM) if the program is less than major (2:p. 2-1), has essentially completed his responsibilities by the time system management responsibility is transferred to an Air Logistics Center (ALC). Like the other functional specialties, the DPML is colocated within the SPO and is responsible to the program or project manager (PM). Unlike the other major functional offices, the DPML is not assigned from AFSC. Throughout the remaining discussions, the terms DPML, ILSO, and ILSM will be used interchangeably

to describe either the logistics manager or the functional office for which he is responsible. Similarly, PM may represent the program manager, project manager, or SPO director, terms used herein to describe agents of the acquisition management process rather than specific position titles.

Two final definitions are necessary in order to address the topic of this research effort: perceptions and barriers. Perceptions, as defined in Webster, are "single unified meanings obtained from sensory processes while a stimulus is present." Barriers are defined as "anything that restrains or obstructs progress." It is conceivable that some identifiable factors have tended to "restrain" the "progress" of ILS within the systems acquisition environment, and that the perceptions of the "barriers" are likely different. What then are the probable barriers to ILS, and about which barriers are perceptual differences likely?

Scope and Content of the Literature Review

Through a comprehensive review of related research and topical articles, the researchers attempted to catalog past barriers to fully implementing ILS in acquisition programs. The literature review focused on writings and research within the last ten years, with particular emphasis on the period since the formation of the AFALD in 1976. Sources consulted included AFIT/LS theses and research papers, RAND Reports, defense and logistics management journals, government reports, Air University and Defense Systems Management College papers,

and the bibliographical and abstract services of the Defense Technical Information Center (DTIC) and the Defense Logistics Studies Information Exchange (DLSIE). The researchers investigated related research through the AF Business Research Management Center at WPAFB and the AF Logistics Management Center at Gunter AFS, Alabama. Several faculty members at the Air Force Institute of Technology and staff members of the AFALD helped develop the research methodology. Key words used in the bibliographical searches included: logistics management, planning, and support; integrated logistic support; systems engineering and management; life cycle costs; Air Force procurement; acquisition regulations, policies, and procedures; maintainability and reliability; and project and program management.

From the literature sources, the researchers were able to collapse the many potential barriers to ILS into eight topical categories that occurred with some frequency. The eight categories of barriers were: organizational structure, goal conflicts, working relations within the SPO between logistics and systems people, authority and responsibilities of the DPML, the skills of acquisition logisticians, the tools with which ILS is implemented, the specification of logistics design parameters, and the test and evaluation of support elements. Each of the eight barriers will be discussed in detail, with consideration of related research, areas where perceptual differences have been shown to exist, and opinions and observations of current writers on the "past barriers" to

ILS.

The Past Barriers to ILS

Organization Structure

While the program office has been a venerable organization in acquisition history, the organization for acquisition logistics has undergone significant changes recently, all described as attempts to improve the integration of logistics concerns with acquisition. Price and Deal examined the organizational factors which AFLC, AFSC, and HQ USAF perceived as contributing to "the difficulty the Air Force has had in implementing ILS [28:83]." At the time of their study (1973), the Air Materiel Areas (AMAs) were responsible for assigning the DPML. It was perceived that this practice introduced a problem of split loyalty in that the DPML's primary responsibility was not to "AFLC as a whole but rather to an individual AMA (or, as sometimes happens, to a program manager) [28:83]." Price and Deal recommended that the DPML be assigned from HQ AFLC rather than from the AMA. In 1974, a DCS/AL was formed at HQ AFLC, and DPMLs were assigned by that office until the AFALD was created to elevate the status of acquisition logistics to the division level. Yet, while the present organizational structure seems to eliminate the past problems, there still seems to be some doubt that the logistics community is really organized for acquisition logistics. The Acquisition Improvement Task Force noted this "barrier" to improved readiness in their 1981 report:

> . . . the logistics organizations in ASD and the Services are set up to manage support functions (supply, maintenance, training, etc.) with little visibility of the total support resources and their interactions for a weapon system [21:p. 9-2].

The report further asserts that "organizations responsible for logistics assessment and for independent evaluation of the readiness implications . . . need strengthening [21:p. 9-2]." To this end, the recent formation of a DCS/AL at HQ AFSC represents another organizational change to improve acquisition logistics, the potential effects of which are speculative at best. It appears possible that the new organization has at least created apprehension within AFALD about the future of the DPML and the AFALD as an "independent" partner in the acquisition process (25).

Another possible factor is the perceived low organizational placement of the DPML, both within the SPO and within the AFLC hierarchy. The DPML was originally conceived as a function at an equal level with other functional specialties in the SPO (5:15-16), and most organization charts reflect this placement. While there is no reason to believe the DPML cannot operate effectively at the functional level, there is a perception that with a higher placement in the organization ("Deputy Program Manager"), the DPML can be more effective in managing ILS. In the F-16 Program Office (ASD),

> . . . the importance of the DPML was dramatically increased . . . when he was elevated to the position of Deputy System Program Director. This position enabled the DPML to more effectively introduce logistics factors in all F-16 SPO directorates [15:217].

According to the F-16 DPML, the F-16 SPO remains the only major program where the DPML apparently has authority commensurate with his title (38), and it is conceivable that the lack of this "status" in other SPOs, along with the other organizational factors studied by Price and Deal, are barriers to ILS whose effects could be perceived differently by the principals in the acquisition process.

Goal Conflict

The Acquisition Improvement Task Force concluded there are perceptions at all levels in the acquisition community that the priorities of cost, schedule, and performance continue to relegate supportability and readiness considerations to secondary importance (21:p. 9-2). Caver's survey of program managers and members of DoD, Congress, industry, and the Services revealed that there was almost 88 percent agreement that "individuals with a key decision-making role in a system's development tend to direct their attention to near-term acquisition cost [11:15]." This could be considered a major barrier to ILS in weapon system acquisition. Dr. Carlucci has stated that supportability must be given equal consideration with cost, schedule and performance, and that designed-in reliability, maintainability, and support must be considered early in the design development (9:1). Buckingham, too, stated earlier that "support costs must be considered on an equal basis with cost, schedule, and performance [8:8]." However, there has been little real shift in priorities

because acquisition costs "are today's costs, and are not considered equally with costs five-to-ten years later [24:6]." Equally compelling is the contention that the system engineer (and the program manager) is judged on how well he meets the goals of cost, schedule, and performance, and now how well the system operates once it is fielded (10:5). In fact PMs generally expect little "challenge and reprobation" if they "miss opportunities for life-cycle cost savings [11:17]." Compounding this are the perceived effects of tenure of the program manager in the SPO.

> Currently, the practice in military career advancement patterns is that people must be rotated periodically, sometimes overlooking the impact on important equipment programs. . . . Program managers simply must be kept in place for much longer periods of time [4:31-32].

Another possible contributor to the alleged goal conflicts between the system requirements and the support considerations is the competition for resources, which is seemingly precipitated by inadequate "front end" funding for acquisition programs.

> Ambitious cost and schedule objectives can be accommodated with minimal adverse effects on support if the funding is made available for additional test hardware . . , reliability and support incentives. . , or other risk-reducing measures. This must be done early in the acquisition cycle since, once the R&D funding is fixed through PPBS [Planning, Programming, Budgeting System] actions or ceilings on development costs, there is little opportunity to add efforts to affect the support characteristics inherent in the new system [21:p. 9-2].

Thus, for a variety of reasons, to which different principals may attach different contributing factors, the "goal conflict"

of performance versus support appears a pervasive barrier to ILS.

Working Relations

It seems logical to include working relations as a potential barrier to the implementation of ILS. The presumed subjugation of logistics goals to performance goals would appear to place the logistician in conflict with the systems engineers and the project managers. Thomas describes conflict as a "condition in which the concerns of two or more parties appear t· be incompatible [34:891]." If, as Chesler asserts, conflict is a

> . . . condition derived from the fact that parties differ from one another in values, goals and material resources . . . [and] these parties are interdependent, and must interact with regard to their differences [12:84],

then it seems that conflict in the project team environment is inevitable. In their study of 100 project teams, Thamhain and Wileman found that such conflict sources as schedules, costs, priorities, technical issues, and personalities showed significant intensity throughout the life cycle of projects (32:35). Hill conjectured that ·onflict occurred because persons with different professiona identities and attitudes toward work were involved in projects that were complex, open-ended, and stress-inducing (19:49). Whether the inevitable presence of conflict affects organizational effectiveness appears to depend on the management behavior among the project leaders (33:81). It is not the purpose of this

research on the barriers to ILS to attempt to make similar correlations between conflict intensities and the effectiveness of the organization. Rather, it is to determine if working relations in project teams is a possible barrier to the "effectiveness" of ILS planning.

DPML Authority

The roles, responsibilities, and authority of the DPML have received much attention in the literature. Price and Deal (28) examined the role of the DPML as perceived by various participants in the acquisition process, specifically AFLC, AFSC, HQ USAF, and the various Air Material Areas (AMAs), now called ALCs. From the results of interviews and surveys from the major participants in the system acquisition process, Price and Deal concluded

> . . . there are some significant differences in the perceptions of the respondents regarding the true role for the DPML. Many of these differences have far-reaching effects, and probably contribute to the difficulty the Air Force has had in implementing ILS [28:83].

This conclusion followed from the finding that system managers and engineering personnel at the AMAs felt strongly that the ILS office should be a logistics liaison office, while the AFSC and HQ USAF felt the DPML should have more authority along with clearly defined responsibilities (28:84). Thus, related to DPML authority, Price and Deal showed that perceptual differences did exist between AFLC and AFSC over the role and authority of the DPML, and that the factor of DPML authority has been described as a barrier to ILS.

Another aspect to the role and authority of the DPML lies within the program office, and concerns the DPML's relations with the PM and the other functional specialists. Babbitt (5) reviewed the ILS charter and compared the existing policies (1975) on ILS to the actual roles, authority, and responsibilities of DPMLs in three SPOs at ASD. Among his findings was that the DPMLs of selected major programs were "not responsible for increased supportability of weapons through early consideration of logistics in design. This responsibility was the system engineers' [5:35]." The three DPMLs characterized themselves as liaisons in the system design effort. Babbitt developed these conclusions by proposing that the two objectives of ILS are: 1) increased supportability of weapons through early consideration of logistics in design; and 2) more efficient logistics support through integrated management of the logistics elements during acquisition. From his study of the roles and authority of the DPMLs, he concluded that for the first ILS objective, the DPML was and should be a liaison to the system engineer, and as such provides AFLC resources to assist in the design, such as analytical models for R&M and support costs. For the second objective, the DPML is characterized as the "integrator" for assuring the logistics elements are planned and provided for (5:38-40). Addison, however, disagrees with this differentiation of authority:

> The management and direction of the purely "logistics" activities . . . [is] not enough to produce the required support elements. We

> also . . . [have] to have a hand . . . in the direction of the total engineering effort. Without this we . . . have failed in our mission [1:6].

From these differences of perceptions, the role, responsibility, and authority of the DPML within the program office are ambiguous, and DPML authority could conceivably be considered a significant barrier to ILS.

Skills of Acquisition Logisticians

The specification of reliability, maintainability, and availability parameters are among the "logistics engineering" responsibilities which are essentially completed when the final design is chosen (39:10). In the later phases of acquisition, it is alleged the importance of "logistics engineering" skills decreases, and the more traditional skills of transportation, supply, etc., become relatively more important (28:76). It is, however, in the early stages where the design is flexible, and technical and cost risks are highest, that ill-considered logistics requirements will have the most impact on life-cycle supportability. It is often asserted that as much as 95 percent of total life-cycle costs are committed by the time the final design is frozen prior to production (8:6; 15:207).

One proposed barrier in the system design process, then, is the availability and assignment of skilled acquisition logisticians at appropriate stages in the acquisition process, such as engineering skills during full-scale development. Price and Deal found general agreement among logistics

managers and program managers that certain skills are more important in certain phases (28:78). Pigaty and Pavlat (27) also identified the skill problem, but they introduced a different perspective.

> The complexity of the ILS concept requires that acquisition logisticians have a broad working knowledge of all the logistic elements as well as related acquisition specialties. The emphasis on career specialization in the recent past has resulted in a lack of the logistics generalists required to implement the ILS concept. Of particular importance is the need for ILS experts who can tailor ILS requirements for inclusion in the RFP, who can communicate these requirements to the design engineer, and who can then remain with the project to insure the successful application of ILS in the succeeding acquisition phases [27:72-73].

There is thus a difference in perspective on the types of skills required in acquisition logistics. One argument is for specialists, time phased to the acquisition cycles. The other argument is for ILS generalists, who can operate through all the acquisition cycles. Nevertheless, both groups of researchers concluded that the lack of appropriate logistics skills is a potential barrier to implementing ILS.

Logistics Management Tools

Logistics management tools, including life-cycle cost (LCC) models, logistics supportability analyses (LSA), and lessons learned are primary aids to ILS planning. Most of the literature on tools dwells on the problems with using LCC models in an attempt to justify today's supportability decisions with LCC estimates which must be extrapolated over 20 or more years.

> Current techniques . . . recognize only those tasks which can be identified a priori. In undertakings involving advanced technology, forecasting explicitly all demands for . . . the ten-to-fifteen year duration of a production program is seldom possible. This is simply too great a demand on human prescience [4:28].

In 1978 the Rand Corporation (22) performed appraisals on many of the most frequently used LCC models. The models are used to support source selection, modification proposals, logistics support costs, spares computations, and manpower estimates. While the authors noted some of the models provide reliable coverage in some applications,

> . . . the principal message that emerges. . . is that current LCC models contain many shortcomings that limit their usefulness for . . . applications requiring estimates of absolute incremental costs . . . . The models cannot in most cases serve as a firm basis for life-cycle cost estimates without additional supporting data and analyses [22:40-41].

The "supporting data" for LCC estimates are considered a problem by some. Operational data are not designed for cost accounting purposes (22:12). The data are frequently unreliable and conflicting, and must be carefully interpreted and applied with a great deal of judgment (22:41). According to Durbin, another problem with LCC estimating is that the models do not incorporate the total costs of alternative decisions. The inadequate and incomplete data more often than not limit analyses to consideration of direct costs only (14:7). While some logistics managers may feel that LCC models have great utility, particularly as the system design becomes less uncertain (8:8), a survey of project managers of high-cost systems revealed that "more credible life-cycle

cost models and data and skilled personnel are needed for projects [11:17]."

Two other tools, LSA and lessons learned, may have different degrees of utility, depending on the perspective of the user. The objective of LSA is to

> . . . structure, within Systems Engineering, a process to systematically pull together all the engineering functions that contribute to the design, development, and deployment of an integrated logistics system [2:p. 10-1].

LSA, then, is a major vehicle for incorporating the logistics considerations in the system design. There are contentions that tools like LSA are misapplied, and often based on erroneous assumptions about equipment utilization:

> LSA is usually applied discretely instead of being an inherent part of the design which limits its benefit. Also the LSA utilizes specific factors for the various conditions of utilization under a selected "standard" scenario [39:11].

Finally, LSA may be a difficult process for PMs, DPMLs, and contractors to understand, and is often alleged to be redundant, unreliable, and very costly, particularly if the data requirements are extensive. For these reasons, many principals in acquisition perceive LSA as being an ineffective and inappropriate tool for some applications (20:21).

Lessons learned is another tool which is subject to differences of interpretations of usefulness. The AFALD has invested in a repository of lessons learned for access by logistics and program management personnel. The Lessons Learned Program is intended to overcome the "difficulty in applying lessons learned and the impacts of [forgotten

lessons] on future logistics support costs [2:p. 35-1]." And, while PMs are encouraged to apply lessons learned in the acquisition process, the extent of applications of lessons learned is not known. It is intuitively appealing that, given the "goal conflict" in systems acquisition, the perceptions of the usefulness of lessons learned is almost certainly different between the AFALD and ASD. Furthermore, the questions of usefulness and credibility of all these tools points to "logistics management tools" as a potentially significant barrier to the realization of ILS program goals.

Logistics Design Goals

Another barrier to ILS, which could also be related to the skills of the acquisition logistician and the effectiveness of the tools, is the problem of quantifying the parameters of reliability, maintainability, and availability which can theoretically be specified analytically and designed into the system (39:10). In their 1973 research, Pigaty and Pavlat found that an inability to quantify ILS requirements was one of the major barriers to ILS:

> Consideration of logistics effects as an integrated whole in relation to operational parameters of a weapon system requires dynamic programming and real-time computer capability. But the mathematical state of the art does not permit sufficient quantification of logistic support design considerations or contractual specifications [27:73-74].

Confounding the perceived difficulty in quantifying the ILS requirements within the program office is the belief that requirements documents, including Statements of Need

(SONs), Mission Element Need Statements (MENS), and Program Management Directives (PMDs), often do not state in sufficient detail the supportability requirements for new systems. The Acquisition Improvement Task Force cites this as a significant barrier perceived by many in the acquisition community:

> Much progress has been made, case-by-case, in recent acquisition programs in all three services. However, major programs continue to come forward for DSARC review without well defined and consistent support and readiness goals [21:p. 9-2].

Thus, the barriers to incorporating supportability in design may be a function of inadequate requirements definitions in implementing directives, an unwillingness or an inability to specify "concrete" requirements, and ultimately, an inability to translate those requirements into enforceable contractual specifications (16:40). It is probable that both the acquisition and the logistics community would agree on logistics design goals as a barrier to ILS, but that the perceptions on why this state exists are likely different.

Test and Evaluation

Secretary Carlucci directed the Under Secretary of Defense for Research and Engineering to insure that acquisition strategies "identify plans for and funding required to acquire adequate subsystem and system test hardware to reduce overall schedule and time risks [9:13]." Yet, it appears test and evaluation remain stepchildren to the mainstream acquisition process. In the report of the Acquisition Improvement Task Force, Secretary Long stated that "nothing

has been done which could be expected to bring about a change in actual practice [21:p. 12-1]." Secretary Long continues with an explanation of the barriers to increased emphasis on test and evaluation (T&E):

> The real problem is our attitude about . . . T&E. Most of those involved in the acquisition process:
>
> a. Have an underlying belief that systems will work as advertised;
>
> b. Tend to regard T&E as a "wicket" to be passed, rather than an essential tool in the process;
>
> c. Believe that, in most cases, money can be saved and the acquisition process speeded up by reducing test hardware and test periods;
>
> d. Seem quite willing to give program go-aheads at key points without reviewing test results; and
>
> e. When confronted with poor test results, tend to be willing to accept promises of correction, and to be impatient about delaying the program to correct problems and retest [21:p. 12-1].

The attitudes about T&E pointed out by Secretary Long affect the demonstration of the reliability and maintainability characteristics that are essential to supportability and readiness. If the perception that cost, schedule, and performance goals edge out logistics goals in the design process, it seems reasonable this attitude may affect the planning and budgeting for supportability testing. Whether the logistics community shares the "attitudes of most of the acquisition community" is a matter for further research.

Review Conclusions

Summary

The review of the literature concerning past barriers to fully incorporating ILS in aeronautical systems acquisition yielded eight categories within which most of the barriers could be grouped. These categories were: organization structure, goal conflict, working relations, DPML authority, skills of logisticians, logistics management tools, logistics design goal definition, and test and evaluation. Some of the research and commentary on barriers to ILS revealed evidence of perceptual differences among several of the principal agents in the acquisition process on the nature and causes of the barriers. From the historical perspectives of the R&D and the logistics community, it seems logical to expect these perceptual differences between the two communities. By extension, the DPML and the PM within the system program office may be expected to perceive the significance of the assumed barriers differently due to their affiliation with the logistics community and the R&D community, respectively. While the assumed barriers reflect the most frequent topics in the literature, there are some other potential barriers which have been excluded from discussion and consideration in the present research effort. These exclusions are discussed in the next section.

Potential Barriers Not Considered in This Research

There are undoubtedly many factors bearing on the "problems" the acquisition community seems to be having incorporating ILS in the acquisition process, and many do not fit the eight categories of barriers discussed above. Some significant factors have been omitted. Three of the most significant are acquisition philosophy, specific policy and guidance for ILS, and overall program funding. These factors and the reasons for their exclusion are the next topic for discussion.

In 1973 Pigaty and Pavlat identified the "current" DoD weapon system acquisition philosophy as a barrier to ILS. The problem was the emphasis on delaying the definition of support requirements due to funding limits and the trend toward parallel development of competing designs (27:74). While acquisition philosophy can be a factor, the researchers concluded that the proposed changes in the philosophy by Dr. Carlucci, reflected in his memorandum (9), are "macro" issues potentially affecting all of acquisition, and not likely to happen quickly.

For much the same reason, the current policies and guidance in DoD Directives and Major Command implementing documents were not considered as a barrier due to the extensive reviews and reissues now occurring. DoD Directive 5000.1 (37) now reflects much of the Carlucci philosophy, and DoD Directive 5000.2 is currently being rewritten. Presumably, AFM 800-2 will be revised, as will AFSC and AFLC derivatives

of these documents.

Another factor that was not specifically incorporated in the list of barriers is the factor of overall program funding. Pigaty and Pavlat identified this as a barrier in their research (27:72), and funding could arguably be the "only" barrier to ILS. However, there are many variables of a national scale that affect the resources allocated the DoD for weapon system acquisition. Consequently, the researchers reasoned that these constraints are cyclical depending on the attention paid to defense at certain times under different administrations, and the barrier of overall program funding is really one of programming fully the funds needed for R&D given the constraints. This barrier is most likely to manifest itself as a "goal conflict" over resources within the acquisition community.

Thus, the barriers around which the research is developed are not necessarily all-inclusive. But, as will be shown in Chapter III, the research methodology was flexible enough to solicit other "perceptions" of barriers to fully implementing ILS. The ones the researchers excluded might well reappear with significant frequency during the data gathering.

How This Research Differs From Previous Research

Since the Pigaty (27), Price (28), and Babbitt (5) studies, there have been significant organizational and procedural changes affecting the management of ILS. Specifically,

the AFALD was created in 1976 to address supportability and life-cycle cost issues early in the program initiation phase. Presently AFSC, working in cooperation with AFLC, is forming a DCS/AL at HQ AFSC (23). These organizational changes conceivably have had or will have some effect on the significance of past barriers to ILS. Concerning ILS policy, there have been many changes in the 1970's, and other changes are pending. Both the organizational and policy changes are ostensibly intended to eliminate or mitigate the barriers to ILS which have been described in previous works.

This research also attempts to test the perceptions of the barriers between the principals in the program office who have responsibility for ILS. Our review shows that this is a somewhat different approach from much of the previous research, which often looked at the issues from one perspective, or from perspectives outside the SPO. It is our contention that if the perceptions of the barriers differ between the principals who are closest to the issues, the DoD has more investigating to do before organizations are changed and policies are rewritten to address the issues. Finally, the research attempts to rank the barriers according to their perceived significance in order to focus the attention of future research on the most pervasive barriers.

CHAPTER III

RESEARCH METHODOLOGY

Research Strategy

To accomplish the objectives of this study, the researchers developed a research strategy designed to collect a representative sampling of opinions and judgments of managerial personnel from each of two major divisions at Wright-Patterson AFB, Ohio. The two major divisions are ASD and AFALD. The design of the research was founded on literature reviews of related research, and specific assessments of opinions proffered by current practitioners of logistics and acquisition management. From the reviews and the opinions, a list of the eight most probable barriers to incorporating ILS in the acquisition process was assembled and constructed into a survey instrument. The researchers then used the survey instrument to gather data on the relative impact each of the proposed barriers had on the ILS effort in a program office. The data were grouped by divisions (AFALD or ASD), and by management levels within each division. The researchers performed statistical analyses on the mean scores between and within the divisions to test the research hypotheses. The development of the measurement instrument, the details of the sample selection plan, the data collection plan, and the data analysis plan are discussed in detail in the remainder of

this chapter.

The Instrument

After determining the factors to be addressed in the study, the researchers needed an instrument they could use to gather perceptions of the impact of these factors on the ILS effort. The instrument had to permit collection of 1) demographic data (to establish the subject's eligibility for the study), and to assign the subject to a group for hypothesis testing; 2) the subject's numerical ratings of the impact of each factor (to establish group mean ratings for hypothesis testing, and to compile a prioritized list of the most significant factors); and 3) the subject's reasoning behind his numerical ratings (to gain some insight into possible explanations for ILS difficulties). With these requirements, the researchers elected to collect data for the study through structured personal interviews, rather than with a mail questionnaire. Typically, a larger proportion of subjects will participate in an interview than will return a questionnaire that must be mailed-in (31:68). In addition, the researchers believed that the presence of the interviewer during data collection would provide some valuable advantages such as:

1) The subject was more likely to devote time to the questions and concentrate on the subject matter.

2) The interviewer could provide on-the-spot explanations of the questions if needed, which would help to limit missing and invalid data.

3) The interview would produce more and richer comments

than possible with a questionnaire, since it is inherently easier and less time-consuming to vocalize opinions than to write them.

4) The interview would allow the flexibility of pursuing a wide variety of relevant topics as they arose, which could not all have been included in a questionnaire.

5) The interactions allowed by the interview would help the researchers to achieve a more complete understanding of the subject's comments than would have been possible from ex post facto interpretation of written comments to specific questions.

The structured interview schedule that the researchers used to collect the data consisted of demographic questions, a rating exercise, and two general, open-ended questions (see Appendix A). The five demographic questions were detailed enough to establish the subject's eligibility for the study according to his experience, and to assign the subject to the correct groups for statistical analyses.

The rating exercise was designed to establish the numerical scores to be used in the statistical analyses. This portion of the interview was very structured, and was designed to be self-explanatory to the subject so it could stand alone with little or no explanation. This approach fosters uniformity from one measurement situation to another through the use of standardized wording. The researchers felt that the use of a structured interview guide would increase the reliability of the measurements, lessen the reactive nature of the interview, and minimize the diversity of interpretation of the questions.

The structured rating exercise consisted of a hypothetical situation, a set of instructions, and a graphic rating scale. The hypothetical case set up a brief scenario of a program office having difficulty with the ILS effort, and whose program manager and ILS manager have turned to the subject for advice on where to look for the causes of the problems. Next, the subject encountered a set of rating instructions designed to facilitate the rating process, and to insure that each subject rated the factors using the same paradigm. The instructions directed the subject to read all eight factors before attempting to rate any of them. By forcing the subjects to read all the factors first, the researchers were trying to prevent the position of the factor on the list affecting a subject's rating of the factor.

The final part of the rating exercise was the scale. Selection of an appropriate scale was dependent on its ability to generate interval data (or a close approximation) for the statistical tests, and also to produce rank-ordered data. After examination of several types of scales, the researchers decided upon a graphic scale as displayed in Appendix A. The basic assumption in using this scale was that interval data was being approximated. While it cannot be asserted that similar differences are numerically exact on a graphic scale, the differences between any two pairs of factor ratings are sufficiently meaningful that they may be ranked in order of absolute size, and thus are approximately interval (30:77).

In order to provide rank-order data, the instructions of the interview guide directed the subject to rate all eight factors on the same scale. By using this approach, all subjects were visually cued to interpret their perceptions of the eight factors in terms of the same standard. Each factor had to be placed relative to the other factors and, therefore, a rank-order could be implied.

Several of Guilford's suggested "General Practices in Connection with Graphic Scales" were very helpful in developing a scale "favorable" to effective graphic ratings (18:267).

1) The rating line was long enough to allow discrimination among eight factors, but not so long as to disrupt the rater's unity of continuum.

2) The line was continuous to represent the continuity of the variable being measured.

3) The "high" impact end of the scale was at the top, which was most natural to raters.

4) The descriptive phrases (cues) were concentrated at points as much as possible.

5) The end cues were not so extreme that they could never be applied, which discouraged central tendency error.

6) The end cues were set in from the ends of the line to allow room for more extreme ratings.

7) A stencil for scoring was used that divided the line into sections to which numerical values were assigned.

The final section of the interview consisted of two open-ended questions that were designed to elicit comments that would enhance the numerical results of the rating exercise.

Instrument Pretest

The researchers pretested the instrument by administering the interview to four Air Force Institute of Technology faculty and four AFALD staff members. All of the pretest subjects had either program management experience, contract management experience, or logistics management experience in a SPO at ASD. The objectives of the pretest were to gain experience in administering the interview, to determine if interview time was reasonable, to evaluate the clarity of the interview text, and to evaluate the instrument content validity.

The researchers first explained the purposes of the research and of the instrument to each pretest subject. Next, the subjects received the interview guide and were asked to read it through and complete the exercise with an eye toward improving the instrument. The subjects were asked to identify those parts that were difficult to understand, and to suggest changes that should be made to the interview prior to field use. Their comments were also solicited as to the completeness of the list of factors inhibiting ILS. In addition, since "establishing the content validity of a measure rests heavily on expert judgment [31:52]," the researchers asked the pretest subjects to evaluate the overall validity of the instrument.

As a result of the pretest, several changes were made to make the rating instructions more concise, and to clarify the overall text. The pretest subjects assessed the list of

factors as sufficient, and judged that the instrument would most likely measure what it was intended to measure.

Sample Selection

The sample selection plan describes how the researchers randomly selected from the target population a sample of individuals accountable for the management of acquisition or acquisition logistics. The target population was defined as individuals assigned to Wright-Patterson AFB who 1) were assigned to either the Aeronautical Systems Division or the Air Force Acquisition Logistics Division; 2) were directly involved in or associated with the acquisition of a product; and 3) could be classified as an accountable manager at one of two management levels. Level I managers included officials who had broad responsibility over a set of related products, such as the Deputy for Airlift and Trainers or his deputy, and the Deputy Program Manager for Logistics or his deputy. Also included in Level I were the program managers of significant singular products, such as the Program Director of the F-15 within the Tactical Systems Program Office. By contrast, Level II managers included program managers or project officers within a singular product division, and the colateral integrated logistics office chiefs. For example, the manager of Special Projects within the F-16 Program office would be a Level II manager.

Having thus defined the target population, the sample selection plan proceeded by selecting program offices in which

the managers meeting these criteria were assumed to work. The purpose of randomly selecting offices rather than names of personnel was justified for two reasons. First, it would be extremely difficult to search personnel rosters to select a target population as defined. Secondly, the incumbents of a responsibility center as defined could logically be expected to meet the target population criteria. Thus, for the purposes of data analysis, and as a simplifying assumption, the heads of two- and three-letter offices were considered Level I managers, and the heads of four-letter offices or below were considered Level II managers. The answer to demographic questions in the interview schedule established the differentiation for data analysis. The researchers further assumed that in selecting the target population in this way, the size of the program office to which a manager was assigned was not an indication of the depth and breadth of his experience. Consequently, no attempt was made to differentiate among the program offices based on such variables as the number of personnel assigned or the relative size, complexity, or phase of the program being managed. The underlying assumption in defining the population in this way was that mere assignment to one of the identifiable branches, program offices, or deputates qualified that manager to evaluate the management problems which may exist between the acquisition office and the logistics office. That is, the director or chief of that office was assumed to meet the target population criteria. Note that this selection plan was not "personality-centered,"

but that experience in acquisition was the relevant consideration. Accordingly, during data analysis, the survey responses of Level I managers with less than six months acquisition experience were ignored, as were the responses of Level II managers with less than two years total acquisition experience. The researchers established the different eligibility time requirements because they judged that, generally, less time was needed for a level I manager to become acquainted with the integration problems. The experience requirement need not have been gained in the current office.

Approximately 50 offices were identified from the current ASD organizational chart (see Appendix C) according to the selection criteria. The office names were listed in order of the chart, and a computer-generated pseudo-random number was assigned to each office. After reseeding the generator, fifteen additional pseudo-random numbers were generated. The fifteen numbers corresponded to the list of organizational names, and identified the sample of offices where interviews were to be conducted (see Appendix D). With the "major" organizations thus selected, the researchers collected organization charts for each office. Candidate offices were identified on each chart and assigned a number. Where the number of individuals exceeded the number of interviews required from the office, the potential subjects were randomly selected from among the candidates using a random number generator. When an office manager was not available during the time when interviews were being conducted, the researchers selected another

manager until the required number of interviews were scheduled in each identified office.

The researchers attempted to interview 15 Level I managers and 30 Level II managers within both ASD and AFALD. However, the maximum number of potential three-letter, Level I subjects in AFALD was limited by the number of three-letter offices in AFALD, which was 10. These sample sizes permitted the use of normal tests of the mean scores between divisions, and t-tests between the organizational levels within each division. The breakdown of the sampling plan and the expected sample sizes is illustrated in Table 1.

TABLE 1

Sample Selection Plan

	ASD	AFALD
Level I Managers	2&3-letter offices n = 15	3-letter offices n = 10
Level II Managers	4-letter offices n = 30	4-letter offices n = 30
TOTALS	n = 45	n = 40

Data Collection Plan

Data for each of the research questions were gathered by personal interviews with subjects from the target population. The interviews were structured to include formal data gathering (closed questions) and subjects' comments. The interviews were guided by an interview schedule (see Appendix

A), which was explained under the section on the research instrument.

Subject Contact Plan

Subjects selected were contacted by telephone and a convenient interview time and date was arranged. During the telephone contact, the researchers introduced themselves and briefly explained their research objectives. The researchers maintained a record on contacts made and interviews conducted, and each interview was correlated to a numbered interview schedule. This bookkeeping method enabled the researchers to contact a subject at a later date if necessary, and provided an effective method of insuring the subjects' anonymity.

Conducting the Interview

Before administering the interview schedule, the researchers explained the purpose of the interview, the objectives of the research, and the reasons why the subject's opinions were being sought. They further explained that the interview was a voluntary exercise, and assured the subject complete anonymity. The researchers then presented the interview schedule to the subject and requested that he complete the biographical questions and the rating exercise. While the instrument was designed to stand alone with no further explanation, any questions the subject had on the interpretation or the execution of the instrument were answered. Any comments that the subjects made while working the interview schedule that were relevant to the research were recorded.

However, interaction between the subject and the interviewer were purposely limited at this time in an attempt to reduce any effect of the interviewer on the rating results. After the subject had completed the instrument, the researchers examined it for completeness, and then proceeded to the two open-ended questions. First, the subject was asked his reasons for rating the factors as he did. Finally, the interviewer requested the subject to suggest any other factors impacting the ILS effort that were not included in the list of factors in the rating exercise. The researchers recorded the comments that both questions evoked on a raw data collection sheet (generally in a paraphrased format). The researchers then concluded the interview.

Data Analysis

The researchers had four major goals in analyzing the data generated by the interviews. The first goal was to determine if significant differences in perception existed between ASD and AFALD managers. Specifically, did the two groups differ in their ratings of the impact of certain factors on the ILS effort in a program office? The second goal was to determine if there were differences in the perceived impact of the same factors between management levels in each organization. The third goal, which was supplementary to the first two, was to determine if there was any consistency of reasoning behind the ratings of the factors. The fourth goal of the analysis was to establish a rank-ordered list of those

factors that were perceived as having significant negative impact upon the ILS effort in the program office.

To satisfy the first two goals, the researchers used the student's t-test to analyze the differences between the group means. The T-TEST procedure from the Statistical Package for the Social Sciences (SPSS) served to calculate the t-values (26:267-275). A listing of the SPSS computer procedures is in Appendix B. The first set of t-tests tested for differences in perceptions between managers of the two major aeronautical systems acquisition participants (ASD and AFALD). The null hypothesis for these tests was:

$$H_0: \mu 1 = \mu 2$$

where:

$\mu 1$ = the group mean rating of a factor for ASD program/project managers.

$\mu 2$ = the group mean rating of a factor for AFALD logistics managers.

The mean scores for each of the eight factors were tested for differences between the two groups at the .05 level of significance. The researchers determined a subject's group assignment based primarily on the individual's current organization, but previous acquisition experience also had a bearing on group assignment.

The second level of t-tests tested for significant differences in the perceived impact of the factors between different management levels in each of the two organizations studied. The null hypotheses for these tests were:

H_0: $\mu 1 = \mu 2$ for ASD

H_0: $\mu 3 = \mu 4$ for AFALD

where:

$\mu 1$ = the group mean rating of a factor for two- and three-letter program/project managers in ASD

$\mu 2$ = the group mean rating of a factor for four-letter program/project managers in ASD

$\mu 3$ = the group mean rating of a factor for three-letter logistics managers in AFALD

$\mu 4$ = the group mean rating of a factor for four-letter logistics managers in AFALD

The researchers again tested for differences in mean scores for all eight factors at the .05 level of significance for all hypotheses. Assignment of subjects to a group for these tests was based upon the individual's organization (ASD or AFALD) and the number of letters in the subject's office symbol.

The researchers established individual subject ratings for each factor by measuring the distance in millimeters from the bottom of the scale to the hash marks representing the subject's impact rating of the factor. The SPSS T-TEST routine then calculated the group means from the individual scores as part of this procedure. If a subject failed to rate a specific factor, that factor was assigned a rating of zero, and was not used in the group mean or t-value calculations. The two-tailed version of the student's t-test was used for all hypotheses because of uncertainty as to which direction that the means would differ. Use of the student's t-test

required that the researchers assume that the underlying populations had both normal distributions and near-equivalent variances. Based on research by Ghiselli (17:63), the assumption of a normal distribution for attitude or opinion measurements is usually a close approximation. However, even if these assumptions were violated, the student's t-test has proven to be a very robust statistical test, and is relatively unaffected by transgression of its underlying assumptions (13: 174).

To accomplish the third goal, the researchers conducted an analysis of the content of the responses to the first open-ended question. (Recall that the first question basically asked for the subject's reasons behind his ratings.) First, they grouped the raw data collection sheets according to organization. Next, one of the researchers classified the comments into impact categories, based on whether the subject rated the factor as having significant, some, or low impact. He then attempted to identify any consistency in the comments by counting the number of times that different subjects gave similar reasons for placing a factor in an impact category. In order to minimize bias, the second researcher repeated the process independently. They then compared tallies, resolved discrepancies, and compiled a joint frequency tally for each factor. A good deal of subjectivity was involved in this analysis process; however, the researchers made every attempt at maintaining objectivity. No names or other demographic data were associated with the raw data sheets at the time of

the comment analysis, so that knowledge of the individual subject's identity would not influence the results. Obviously, empirically based conclusions could not result from such an analysis. The data were used as supplemental information only, with the overall trends in frequencies of responses providing some insight into the numerical ratings.

The final goal was to list the most significant ILS problem areas in order of importance as perceived by ASD and AFALD managers. To do this the researchers examined each organization's mean ratings of all eight proposed factors. From these scores they compiled a list of those factors perceived as being responsible for the most concern at the program office level. The cutoff mean score for a factor considered significant was not established at the outset of the research, and was quite arbitrary. The researchers did not intend for this list to be all-inclusive, nor did they propose that the rank-order presented be absolute. They merely attempted to provide a narrowed-down, prioritized list to point the way for any further research into problems for ILS management.

CHAPTER IV

FINDINGS

Introduction

The findings are addressed in the order in which the analyses were conducted. Information on the composition and demographic characteristics of the data sample are presented first. The demographic section is followed by a discussion of the results from the statistical analyses. Next, the authors present a summary of the comments which the interview subjects offered to support their rankings of the barriers. The comments were grouped by specific barriers, and are presented as frequency tables. The chapter concludes with a discussion of several other considerations that the researchers judged as relevant to the findings.

Demographic Composition of the Sample

The researchers interviewed program managers and logistics managers assigned to program and project offices within the ASD and AFALD at Wright-Patterson AFB, Ohio. (Selection of the offices was described in the sample selection plan in Chapter III.) Sufficient sample size goals were established for each group of subjects to insure adequate precision in the statistical results of the hypothesis tests. The actual sample sizes show some deviations from the sample size goals,

but none that should have adversely affected the reliability or precision of the analyses.

There were several reasons for not achieving the planned sample size goals. The results of two interviews were discarded because the subjects did not meet the experience levels established as eligibility criteria for the study. Three interviews were not used in the statistical analyses because the logistics managers were personnel resources of an Air Logistics Center (ALC) and not assigned to the AFALD. By virtue of their home organization, the subjects were not members of either of the two main groups. An Inspector General visit to the Airlift and Trainer program office (ASD/AF) precluded some interviews. The loss of the ASD/AF interviews primarily affected the ASD Level II group. Finally, despite repeated attempts to schedule the interviews, a few of the selected subjects were not available during the five-week period when interviews were conducted. (The researchers established a cutoff date for interviews to provide themselves with sufficient time to complete the study within thesis time constraints.)

For Level I management groups, the actual sample sizes exceeded the established goals. The sample size goals were originally set recognizing the limited number of Level I managers available (especially in AFALD). In an effort to enhance the precision of the statistical analyses, the researchers expanded these sample sizes by conducting two interviews in some Level I offices (the office chief and his deputy if both were available). It could be argued that this was a deviation

from the sampling plan, and that the results could be biased in favor of those offices where both the chief and deputy were interviewed. However, the interview was designed to have the managers use their experience to extend their horizons beyond their current work office, and only a few were unwilling to take that perspective. Therefore, the potential effects of interviewing two managers in the same office should have been minimal. Also, the researchers felt that the benefits of the increased sample sizes outweighed any bias effect. Overall, the researchers conducted 82 interviews, 77 of which were used for the statistical analyses. The actual group sample sizes are displayed in Table 2.

TABLE 2

Actual Group Sample Size

	ASD	AFALD
Level I Managers	2&3-letter offices n = 21	3-letter offices n = 11
Level II Managers	4-letter offices n = 19	4-letter offices n = 26
TOTAL	n = 40	n = 37

A list of the major program offices in which interviews were conducted is in Appendix D.

Statistical Results

The statistical analyses, as outlined in the previous chapter, tested the research hypotheses. The researchers

used statistical null hypotheses derived from the research hypotheses as a basis for the tests. All of the t-values used for hypothesis testing were calculated using a pooled variance estimate. The pooled variance estimate is derived from the sample variances of both groups involved in the test. Use of the pooled variance was justified because estimates of the variances of the two underlying populations for each of the tests proved to be sufficiently equal (based on F-values calculated by SPSS T-TEST routine (see Appendix B)).

Research Hypothesis 1

The null hypothesis used to test Research Hypothesis 1 was:

> ASD program/project managers and AFALD logistics managers have similar perceptions of the impact of proposed barriers to the implementation of ILS.

Using a two-tailed student's t-test at a significance level of $\alpha = .05$, the researchers were not able to reject this hypothesis for seven of the eight assumed barriers. (For the results regarding all of the hypothesis, see Appendix B.) These results imply that the two groups were in general agreement on the significance of the impact that seven of the eight factors had on the implementation of ILS in a program office. However, there was a significant difference between the two groups' assessments of the impact of DPML Authority. The AFALD managers rated the "lack of decision-making authority" possessed by the logistics manager as having a much higher impact than did the ASD group. This result suggests that

the AFALD group considered the lack of authority a more significant barrier to ILS.

Research Hypothesis 2

The null hypothesis used to test Research Hypothesis 2 was:

> ASD Level I managers and Level II managers (as defined in the sample selection plan) have similar perceptions of the impact of proposed barriers to the implementation of ILS.

A two-tailed student's t-test at a significance level of $\alpha = .05$ was also used to test this hypothesis. The researchers found that the hypothesis could not be rejected for any of the factors in the tests between ASD management levels (see Appendix B). These results imply that the different levels of ASD management in the program office have a generally uniform perception of the factors and their impact on ILS.

Research Hypothesis 3

The null hypothesis used to test Research Hypothesis 3 was:

> AFALD Level I managers and Level II managers (as defined in the sample selection plan) have similar perceptions of the impact of proposed barriers to the implementation of ILS.

A two-tailed student's t-test at a significance level of $\alpha = .05$ was also used to test this hypothesis. The researchers found that the hypothesis could be rejected for only one of the factors in the tests between AFALD management levels. These results imply that the different levels of AFALD management in the program office have a generally uniform perception

of the factors and their impact on ILS with respect to all the proposed barriers except Logistics Design Goal Definition. The four-letter office personnel (Level II) in AFALD rated the "inadequate definition of logistics design parameters and requirements" significantly higher than did the three-letter office chiefs (Level I). Both groups rated the factor as having significant impact, however.

Research Question

The research question was stated as:

> What is the rank-order of the significance of the selected barriers to ILS as rated by the ASD managers and as rated by the AFALD managers, and how do they compare?

The researchers ranked the factors according to their group mean scores to provide an understanding of the general order of significance of the factors as perceived in each organization, and to allow comparisons between the organizations. The mean scores and the resulting ranks are presented in Table 3. The mean ratings are representative of the organizations' average placement of the factor in the graphic scale (measured in millimeters).

The most interesting result of the rank-order exercise was with respect to DPML Authority. The difference of opinion between ASD and AFALD on the effect of this factor, first discovered in the t-test results, reappeared in the rankings. The logistics managers' ratings ranked DPML Authority as the third most significant barrier on the list, with a substantial advantage over the fourth ranked factor. The ASD group, on

TABLE 3

Proposed Barriers Ranked By
Organization Mean Ratings

Rank	ASD		AFALD	
	Factor	Mean	Factor	Mean
1	Design Goals	71.73	Design Goals	68.32
2	Goal Conflict	66.05	Goal Conflict	66.11
3	Skills	58.28	DPML Authority	63.78
4	Work Relations	50.65	Skills	58.00
5	DPML Authority	50.40	Logistics T&E	53.57
6	Tools	48.00	Org. Structure	47.62
7	Logistics T&E	47.85	Tools	47.14
8	Org. Structure	43.88	Work Relations	42.97

the other hand, ranked DPML Authority fifth, where it was among four closely grouped factors perceived as having only moderate impact.

The results of the rank-orders corroborate the findings of the t-tests. There was general agreement between the two organizations with respect to the ranking of the factors. General agreement, that is, except concerning the effects of authority (or lack thereof) given to the logistics manager.

Frequency Tables of Interview Subjects' Comments

Tables 4 through 11 are frequency tallies of the comments the interview subjects offered to explain the way each ranked the assumed barriers to ILS. There is one table for each of the assumed barriers. Table 12 is a compilation of other factors the respondents deemed significant. These tables are admittedly simplified, as they are only intended to

highlight the general content of the complete comments which are included in Appendix E.

Within each table, the general subjects of the comments are listed in the left margin, and the number of times the comment occurred is tallied in the table. The frequencies are further broken down by the group to which the respondent belonged, either ASD or AFALD. Finally, the tallies are subdivided by the degree of significance the respondent attached to his ranking of the impact of the barrier. The degrees of snigificance were "significant" impact, "some" impact, and "low" impact. The assignment of the "impacts" were somewhat arbitrary judgments of the researchers, and were based on the relative position at which the respondent marked the graphical rating scale (Appendix A).

Other Considerations

The researchers made several observations during the course of the study that may assist in reviewing the findings:

1) Although the interview guide was intended to stand alone, the rating process had to be further explained to several interview subjects. While the researchers did want to limit interaction with the subjects before and during the rating exercise, they believed that the explanations rendered did not compromise any of the findings.

2) In approximately five interview situations, two subjects were interviewed simultaneously in the same room. The double interviews were caused by the subjects' availability

TABLE 4

Organizational Structure Frequency of
Comments with Impact Ratings

Comment	ASD			AFALD		
	sig	some	low	sig	some	low
1. Dual chain of command divides DPML loyalty	4	4		4	2	1
2. Low DPML organization position	2			3		
3. Another organization structure is better	1	3		1	1	
4. Dual chain of command is beneficial		3	2	3	1	2
5. Too many bureaucratic procedures in AFLC		1	1			
6. DPML is at the proper organization level		1	3			2

Observations:

1. 39 subjects (48%) commented on this barrier.

2. Few subjects felt the DPML was in a low position in the organization; six subjects commented the DPML was at the right power position.

3. Between divisions, nearly equal numbers (8&7) felt the dual chain of command affected the DPMLs adversely. An almost equal number felt the dual chain of command was an advantage to the DPML.

4. Of those who felt another organization structure would be better, two criticized the matrix concept. The remainder anticipated improvements with the creation of DCS/AL at HQ AFSC.

TABLE 5

DPML Authority Frequency of
Comments with Impact Ratings

Comment	ASD			AFALD		
	sig	some	low	sig	some	low
1. DPML constrained by AFLC bureaucracy	3	1				1
2. DPML's authority depends on his personal traits	3	1	6	4	3	
3. DPML has no authority; is advisor or liaison	3	2		4		
4. DPML should not have control of funds	2	1				
5. Military grade structure limits DPML vice PM				1	1	
6. DPML should have control of funds for support				5		
7. Functional title gives DPML authority			4		1	1

Observations:

1. 47 subjects (57%) commented on this barrier.

2. Significantly more respondents in both divisions felt the personality characteristics of the DPML were more important than the legitimate power or authority derived from the functional organization.

3. Three ASD respondents stated the DPML should have no control over any funds for support issues. No AFALD subjects echoed this. In contrast, only five subjects stated the DPML should have control over funds, and these were all AFALD personnel.

4. Nine subjects, from both divisions, felt authority was a barrier, since the DPML has no authority whatsoever.

TABLE 6

Logistics Management Tools Frequency of Comments with Impact Ratings

Comment	ASD			AFALD		
	sig	some	low	sig	some	low
1. General Comments						
a. Users lack experience	1		2			
b. Not useful all phases	1	1	1	1	2	
c. Tools lack credibility	1	1	3	1	1	3
2. Life-cycle cost models						
a. Users do not tailor	1	1			1	
b. Lack credibility	2		3	2	2	
c. Users lack skills		1	1	1		
3. LSA						
a. Redundant				1	1	1
b. Good tool if tailored				1	2	
c. Users lack skills		1			2	1
d. Guidance is poor					2	
4. Lessons Learned						
a. Useless		1			3	
b. Not applied properly	2	1				

Observations:

1. 42 subjects (51%) commented on this barrier.
2. "Lack of credibility" appears a minus for all tools.
3. The lack of significant comments for tools may reflect either ambivalence about their usefulness, or ignorance of the uses and objectives of the tools.
4. Only one ASD respondent commented on LSA, which may show the amount of attention paid this most highly touted tool.

TABLE 7

Logistics Skills Frequency of
Comments with Impact Ratings

Comment	ASD			AFALD		
	sig	some	low	sig	some	low
1. Lack early involvement of analysts, engineers	4	2		5		1
2. Lack proper skills in a certain program phase	2	1				
3. Generally lack any useful skills/experience	11	5		10	6	1
4. Logisticians move around too much	3			4	2	
5. Training, guidance, or leadership lacking	2	1		5	1	
6. Manning levels are inadequate		1			1	

Observations:

1. 68 subjects (83%) commented on this barrier.

2. Both ASD and AFALD respondents felt strongly the lack of any type of relevant experience or skill was a more significant barrier to ILS that the problem of early involvement and special skills tied to a particular acquisition phase.

3. The lack of relevant skills could be a function of the training, guidance, and leadership mentioned as equally significant by ASD and AFALD respondents.

TABLE 8

Working Relations Frequency of
Comments with Impact Ratings

Comment	ASD			AFALD		
	sig	some	low	sig	some	low
1. Technical competence enhances communications	1			1		
2. Personal, professional, or technical conflicts	5	2		3	3	2
3. Lack of communication due to specialized language	1					1
4. Lack of involvement by logisticians	5	1	3	2	2	2
5. Conflict due to divided loyalties	1		1	1		

Observations:

1. 37 respondents (45%) commented on this barrier.
2. Personnel of both divisions agreed that conflicts caused by personality, professional, or technical issues were a significant barrier.
3. Both divisions agreed that logisticians tend to delay getting involved in relevant issues in the program office.
4. The special technical languages of acquisition logistics and systems engineering were not mentioned frequently by personnel of either division as being a barrier.

TABLE 9

Logistics Design Goal Definition Frequency of Comments with Impact Ratings

Comment	ASD			AFALD		
	sig	some	low	sig	some	low
1. Design parameters cannot be quantified	7	1		5		
2. Cannot predict effects of design requirements	3	1				
3. Wrong people are trying to define the goals	4			1		
4. Log goals subordinate to other program goals	5			1	1	
5. Lack of incentives to contractors	1			4		1
6. No agreement on what log goals should be	4			3		
7. Goals not determined early enough	1			6		1
8. Program directives are not specific, binding	3			4	1	
9. Well-defined requirements priced-out by contractor				1	2	

Observations:

1. 61 subjects (74%) comments on this barrier.
2. Both AFALD and ASD personnel agreed it is very difficult to specify concrete logistics design requirements or goals, due partly to a lack of skilled technicians, indefinite program directives, and a lack of using command involvement.
3. Few AFALD personnel felt the problem was due to a subordination of logistics program objectives to the program objectives. Five ASD program managers felt this was a significant problem.

TABLE 10

Logistics Test and Evaluation Frequency of Comments with Impact Ratings

Comments	ASD			AFALD		
	sig	some	low	sig	some	low
1. Inadequate funds for T&E	4	1			1	
2. Time constraints due to IOC, concurrency	2		1	1		
3. Logistics T&E subordinate to other program goals	2	1		3	1	1
4. Cannot define tests for supportability	1	2	1		1	1
5. Inadequate reporting of test results				1		1
6. Testing too late to be of any use	1	2	3			1
7. The wrong people, skills involved in tests		1			2	

Observations:

1. 30 subjects (37%) commented on this barrier.
2. Only the ASD respondents felt the impacts of inadequate funding and time constraints were significant barriers to supportability T&E.

TABLE 11

Goal Conflict Frequency of
Comments with Impact Ratings

Comment	ASD			AFALD		
	sig	some	low	sig	some	low
1. The goals are cost, schedule, performance	9			7	2	2
2. Short-term savings mentality of managers	6			7	1	
3. Not enough money to do all requirements	3			3		
4. Accelerated schedules, IOC dates	1			1	1	
5. PM is rated on cost, schedule	4	1		7		
6. Inherent bias to performance in tradeoffs	3					1
7. PMs do not stay in program long enough	2			1		
8. The goal conflict problem is overrated		1				4

Observations:

1. 67 subjects (82%) commented on this barrier.

2. There are generally consistent perceptions between groups on the nature of this barrier. Almost equal numbers in each division felt cost, schedule, and performance were the goals of primary importance in any program.

TABLE 12

Other Factors Considered Significant
by Interview Subjects

Comments	ASD	AFALD
1. Overall program funding	4	5
2. Contracting policies	1	3
3. Funds, schedule changes	2	
4. Lack guidance in PMDs	1	3
5. Non-standard SE		3
6. Other (nine different factors)	3	6

Observations:

1. 31 subjects (36%) suggested a potential barrier to ILS that was not included in the interview rating exercise.

2. Some of the suggested barriers (e.g., overall program funding) were accounted for by other subjects as a source of "Goal Conflict."

3. No additional factor was mentioned frequently enough to significantly affect the overall ranking of the barriers as presented in Chapter IV, "Findings."

and space restrictions. Since the graphical rating exercises were still completed independently, this arrangement should not have compromised any of the statistical findings. A subject's comments, however, could have been influenced by another's presence. The researchers recognize this as a weakness, but believe that it had a minimal effect on the statistical findings.

3) As anticipated in interview-based research, the interviewers matured during the data gathering. Each succeeding interview added to their skill in administering the instrument, and to their knowledge of the subject matter. The likely results of this maturation were more and richer comments from the later interviews because of the increased ability to ask the "right questions" during the open-ended portion of the interview.

4) The matter of organizational structure turned out to be more complex than anticipated. During the data gathering process, the researchers learned of the creation of the DCS/AL at HQ AFSC. Most of the subjects knew something about the new office, and some speculated on its eventual effects. The organizational structure for acquisition logistics, therefore, was changing during the research, and this dynamic state makes any conclusions about the effects of organizational structure questionable.

A Final Caveat

Because of the difficulty associated with accurately measuring opinions and perceptions, the authors of this research do not desire to imply any undue statistical rigor to the results of this study. All of the basic tenets of scientific research were followed, and every attempt was made to produce reliable and valid results. However, this research was designed as a pilot study of the possible barriers to implementing ILS in a program office, and the researchers are content to present the results as general indications which future researchers may wish to consider.

CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

Research Hypothesis 1: Perceptions Between ASD and AFALD

Research Hypothesis 1 was:

> The perceptions of the significance of eight assumed barriers to fully implementing ILS in aeronautical systems acquisition differ between ASD program/project managers and AFALD logistics managers.

Based on the findings, the researchers rejected Research Hypothesis 1 for all factors except DPML Authority.

Discussion

There was general agreement between ASD and AFALD managers on the relative impact of seven of the eight proposed barriers on the implementation of ILS. The single factor which evoked a significant disagreement between the two organizations was DPML Authority. For the purposes of this research, the factor entitled DPML Authority was previously defined as:

> The lack of decision-making authority delegated to the logistics manager, such as inadequate inputs, coordination, or approval over the way in which program funds are spent and other program decisions are made.

As the literature review pointed out, the role and authority of the DPML position has been a matter of much discussion and disagreement since its creation. It would appear that this fact has not changed since Price and Deal (28) discovered the

differences in 1973, and that the nominal authority of the DPML has not been improved since the advent of the AFALD in 1976.

Research Hypothesis 2: Perceptions Within the ASD

Research Hypothesis 2 was:

> The perceptions of the significance of the eight assumed barriers to fully implementing ILS in aeronautical systems acquisition are uniform between organizational levels within the ASD.

Based on the findings of this research, the researchers failed to reject Research Hypothesis 2 for all eight factors.

Discussion

There was general agreement between management levels of the ASD regarding all eight of the proposed barriers to ILS. No significant differences existed in the ratings for any factor between Level I and Level II managers. Therefore, the researchers judge that the ASD group mean ratings accurately represent the impact of the factors as perceived throughout ASD program/project management levels in system program offices.

Research Hypothesis 3: Perceptions Within the AFALD

Research Hypothesis 3 was:

> The perceptions of the significance of the eight assumed barriers to fully implementing ILS in aeronautical systems acquisition are uniform between organizational levels within the AFALD.

Based on the findings of this research, the researchers failed

to reject Research Hypothesis 3 for all eight factors.

Discussion

There was substantial agreement between different management levels in AFALD regarding the relative impact of proposed barriers to ILS. However, a difference was found between the ratings of Level I and Level II managers in AFALD with respect to Logistics Design Goal Definition. The Level II managers rated this factor higher than Level I managers. However, both management levels rated this factor as significant, and the difference was only with respect to the degree of significance. The Level II group rated Logistics Design Goal Definition as the most significant barrier. In contrast, Level I managers rated this factor third most important, behind DPML Authority and Goal Conflict. Even with this difference in the degree of significance, there remained an overall uniformity of perception among the management levels in AFALD regarding the impact of the factors. Therefore, the researchers judge that the AFALD group mean ratings accurately represent the impact of the factors as perceived throughout logistics management levels in system program offices at ASD.

Research Question: Rank-Order of Barriers

The Research Question was:

> What is the rank order of the significance of the eight assured barriers to ILS as rated by the ASD managers and as rated by the AFALD managers, and how do they compare?

Based on the findings of the research, both groups of managers

ranked Logistics Design Goal Definition and Goal Conflict as the most significant barriers to fully incorporating ILS.

Discussion

Four of the factors proposed as barriers to ILS by this research deserve further attention by virtue of being ranked well above the other factors. Both groups of managers consistently rated three factors as the most significant barriers to the implementation of ILS. The three factors perceived as having a high negative impact by both groups were previously defined as (listed in descending order of significance):

1) Logistics Design Goal Definition: Inadequate definition of logistics design parameters and requirements in program directives, combined with the difficulty in translating those parameters which are identified into achieveable, verifiable goals for the contractor.

2) Goal Conflict: For example, system design trade-offs which consistently and forcefully emphasize performance oriented goals over long-term supportability goals.

3) Logistics Skills: Failure to employ appropriately skilled logisticians during the different phases of the acquisition cycle. Due possibly to a lack of skilled or trained logistics specialists, or to misassignment of available specialists.

The significance of these findings is that if the barrier of Goal Conflict does begin to erode, as intended by the Carlucci Initiatives, the members of the logistics community must be concerned about their ability to step forward and define clearly what good logistics design goals are.

The AFALD managers also rated the lack of DPML Authority as a significant barrier (ranked second between Goal Conflict and Logistics Skills), while the ASD group did not. The researchers cannot confidently conclude that this is a significant barrier to ILS based solely on the AFALD rating. Before any action is undertaken to increase the logistics manager's authority in the program office, a more in-depth study of the situation should be completed. A common argument against rating this factor as significant was that it is not the authority delegated to the logistics manager that will make the ILS effort work, but its success has more to do with the initiative and aggressiveness of the logistics manager himself.

In both organizations there seemed to be a natural break-point in the ratings below which the differences between factors were so small that it was difficult to establish one factor as more significant than another. In addition, the factors that were rated below the break-point fell in the "Some" and "Low" impact categories on the graphic scale. The researchers used this break to discriminate between the significant barriers and the rest of the factors. There were four factors that were consistently rated below this point and, therefore, were classified as barriers of only moderate impact. These four factors were:

1) Organizational Structure
2) Logistics Management Tools
3) Working Relations

4) Test and Evaluation

(Note: For the definitions associated with these factors in this research, see Appendix A.)

Generalizability of Findings

The findings of this research are not generalizable outside the realm of aeronautical system acquisition. The differences inherent between the major Air Force acquisition divisions, and the unique logistics requirements of complex aeronautical systems make it difficult to transfer the findings of this research to other types of systems and their acquisition.

Recommendations

The researchers offer these recommendations for further study, based on the findings of this research:

1) Examine each of the barriers identified as "significant" in more detail to formulate methods to remove them or reduce their impact. Special attention should be given to studying the situation surrounding the factor of DPML Authority in an effort to understand the different perceptions of this issue, and to discover if the lack of authority possessed by the logistics manager does, in fact, inhibit an effective ILS program. The comments collected during this research (Appendix E) should help to frame this study.

2) Reaccomplish this research while controlling for a) the different phases of the programs, and b) the size and

complexity of the acquisition program. It is possible that pursuing a study of this nature would identify different barriers to ILS depending on the controlled variables.

3) Examine the same factors in the environments of other AFSC product divisions, or the acquisition processes of other services, to discover if some of the same issues are evident throughout the DoD acquisition arena.

APPENDIX A

INTERVIEW SCHEDULE

Schedule No. _____

PERSONAL DATA

1. What is your present grade?

   A. 0-1 to 0-3
   B. 0-4 to 0-5
   C. 0-6 or higher
   D. GS-9 to GS-12
   E. GS-13 to GS-14
   F. GS-15 or higher
   G. Other

2. How long have you worked in system acquisition?

   A. Less than six months
   B. Six months to one year
   C. One to two years
   D. More than two years

3. To which organization are you assigned?

   A. ASD
   B. AFALD
   C. Other: specify_____

4. The number of letters in my work day office symbol is:

   A. Two
   B. Three
   C. Four or more

5. I would classify my overall experience in systems acquisition as primarily related to:

   A. The logistics aspects of acquisition programs
   B. Program management or systems engineering aspects
   C. Both A and B
   D. Other: specify_____

A HYPOTHETICAL CASE

A Systems Program Manager and his Deputy for Logistics have come to you for advice. The program for which they are responsible is proceeding well technologically, but they are having difficulty integrating logistics requirements with the development program. Together they have developed a list of the possible factors which may be contributing to their problem. The two managers are confident that with your advice, they will gain a better understanding of the relative impact each of the factors is having on the logistics program. They have asked you to apply your personal experience and professional judgment to help them.

INSTRUCTIONS

A. FROM YOUR OWN EXPERIENCE, please help the managers rate the probable relative impact of each of the factors they have described.

B. PLEASE READ THE ENTIRE LIST OF FACTORS before you attempt to rate the impact of any of them.

C. SELECT the factor you feel has the MOST IMPACT, mark it on the scale, and place the number of the factor next to the mark.

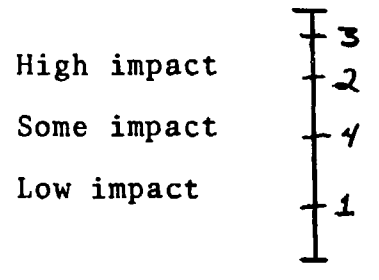
D. CONVERSELY, identify the factor you feel has the LEAST IMPACT and mark it on the scale, along with its identifying number.

E. REPEAT STEPS C and D using the remaining factors until you have marked all the factors on the scale.

F. If you feel two or more factors are equally important, use a single mark, but please be sure all factor numbers are accounted for.

EXAMPLE OF THE RATING PROCESS DESCRIBED: What is relative impact of each of these factors on your check book balance?

1. ENTERTAINMENT EXPENSES
2. CAR LOAN
3. HOME MORTGAGE
4. MEDICAL EXPENSES



Schedule No._____

FACTORS

1. ORGANIZATIONAL STRUCTURE: Primarily the low relative position of the integrated logistics support office within the program office, and the dual chain of command for the logistics manager.

2. DPML AUTHORITY: The lack of decision-making authority delegated to the logistics manager, such as inadequate inputs, coordination, or approval over the way in which program funds are spent and other program decisions are made.

3. LOGISTICS MANAGEMENT TOOLS: The misuse or non-use of such quantitative and qualitative tools as Life Cycle Cost (LCC) models, Logistics Supportability Analyses (LSA), and Lessons Learned repositories during support and product design.

4. LOGISTICS SKILLS: Failure to employ appropriately skilled logisticians during the different phases of the acquisition cycle. Due possibly to a lack of skilled or trained logistics specialists, or to misassignment of available specialists.

5. WORKING RELATIONS: Lack of communication or cooperation between the logistics personnel and other functional specialists within the program office.

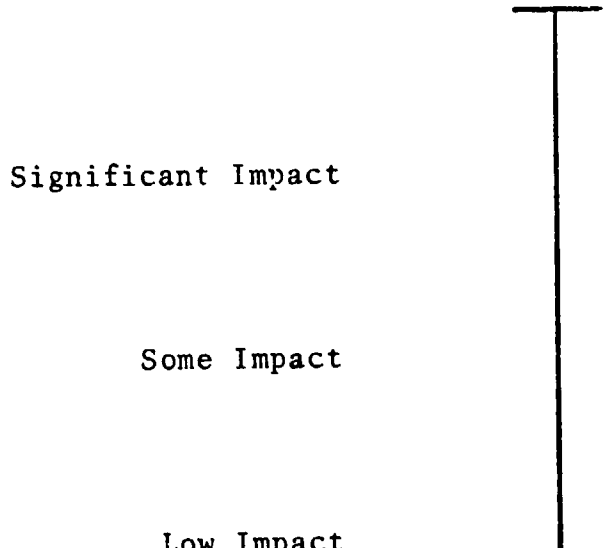
6. LOGISTICS DESIGN GOAL DEFINITION: Inadequate definition of logistics design parameters and requirements in program directives, combined with the difficulty in translating those parameters which are identified into achievable, verifiable goals for the contractor.

7. TEST AND EVALUATION: Inadequate T&E for supportability characteristics due to poor planning, limited budgeting, or other resource and time constraints.

8. GOAL CONFLICT: For example, system design trade-offs which consistently and forcefully emphasize performance oriented goals over long-term supportability goals.

Schedule No._____

Graphical rating scale: All factor rankings will go on one scale. Make a hash mark which indicates your feelings about the impact each listed factor had on the problems in the hypothetical program office. Make sure each hash mark is identified by the number of the factor which it represents.



Schedule No._____

RAW DATA COLLECTION SHEET

1. Respondent's explanations of ratings for top factors:

2. Respondent's suggestions of other significant factors.

APPENDIX B

SPSS PROGRAM, DATA, AND ANALYSES

VOGELBACK COMPUTING CENTER
NORTHWESTERN UNIVERSITY

S P S S - - STATISTICAL PACKAGE FOR THE SOCIAL SCIENCES

VERSION 8.0 -- JUNE 18, 1979


```
RUN NAME          ILS ANALYSIS
PRINT BACK        CONTROL
VARIABLE LIST     Q1 TO Q13
INPUT MEDIUM      DISK
N OF CASES        UNKNOWN
INPUT FORMAT      FIXED(5A1,8F2)
VAR LABELS        Q1,GRADE/Q2,YEARS OF EXP./Q3,ORGANIZATION/Q4,OFFICE LEVEL
                  /Q5,ACQ. EXP./Q6,ORG STRUCTURE/Q7,DPML AUTHORITY/Q8,
                  LOG MANAGEMENT TOOLS/Q9,SKILLS/Q10,WORKING RELATIONS/Q11,
                  LOG DESIGN GOAL DEFINITION/Q12,TEST & EVAL/Q13,GOAL CONFLICT/
MISSING VALUES    Q1 TO Q13 (0)
RECODE            Q1 TO Q5('A'=1)('B'=2)('C'=3)('D'=4)('E'=5)('F'=6)
                  ('G'=7)(ELSE=0)
FREQUENCIES       GENERAL=Q1 TO Q5
OPTIONS           3,8
STATISTICS        ALL
READ INPUT DATA
*SELECT IF        (Q3 EQ 2)
T-TEST            GROUPS=Q4(3,2)/VARIABLES=Q6 TO Q13
*SELECT IF        (Q3 EQ 1)
T-TEST            GROUPS=Q4(3)/VARIABLES=Q6 TO Q13
FINISH
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ILS ANALYSIS DATA FILE

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GROUP 1 - ASD
GROUP 2 - AFALD

VARIABLE	NUMBER OF CASES	MEAN	STANDARD DEVIATION	STANDARD ERROR
Q6 ORG STRUCTURE				
GROUP 1	40	43.8750	24.916	3.940
GROUP 2	37	47.6216	27.845	4.578

POOLED VARIANCE ESTIMATE

F VALUE	2-TAIL PROB.	T VALUE	DEGREES OF FREEDOM	2-TAIL PROB.
1.25	.496	-.62	75	.535

VARIABLE	NUMBER OF CASES	MEAN	STANDARD DEVIATION	STANDARD ERROR
Q7 DPML AUTHORITY				
GROUP 1	40	50.4000	25.394	4.015
GROUP 2	37	63.7838	22.409	3.684

POOLED VARIANCE ESTIMATE

F VALUE	2-TAIL PROB.	T VALUE	DEGREES OF FREEDOM	2-TAIL PROB.
1.28	.451	-2.44	75	.017

GROUP 1 - ASD
GROUP 2 - AFALD

VARIABLE	NUMBER OF CASES	MEAN	STANDARD DEVIATION	STANDARD ERROR
Q8 LOG MANAGEMENT TOOLS				
GROUP 1	40	48.0000	20.474	3.237
GROUP 2	36	47.1389	19.152	3.192

POOLED VARIANCE ESTIMATE

F VALUE	2-TAIL PROB.	T VALUE	DEGREES OF FREEDOM	2-TAIL PROB.
1.14	.692	.19	74	.851

VARIABLE	NUMBER OF CASES	MEAN	STANDARD DEVIATION	STANDARD ERROR
Q9 SKILLS				
GROUP 1	40	58.2750	21.655	3.424
GROUP 2	36	58.0000	21.533	3.589

POOLED VARIANCE ESTIMATE

F VALUE	2-TAIL PROB.	T VALUE	DEGREES OF FREEDOM	2-TAIL PROB.
1.01	.978	.06	74	.956

GROUP 1 - ASD
GROUP 2 - AFALD

VARIABLE	NUMBER OF CASES	MEAN	STANDARD DEVIATION	STANDARD ERROR
Q10 WORKING RELATIONS				
GROUP 1	40	50.6500	27.530	4.353
GROUP 2	37	42.9730	26.156	4.300

POOLED VARIANCE ESTIMATE

F VALUE	2-TAIL PROB.	T VALUE	DEGREES OF FREEDOM	2-TAIL PROB.
1.11	.759	1.25	75	.214

VARIABLE	NUMBER OF CASES	MEAN	STANDARD DEVIATION	STANDARD ERROR
Q11 LOG DESIGN GOAL DEFINITION				
GROUP 1	40	71.7250	17.461	2.761
GROUP 2	37	68.3243	21.217	3.488

POOLED VARIANCE ESTIMATE

F VALUE	2-TAIL PROB.	T VALUE	DEGREES OF FREEDOM	2-TAIL PROB.
1.48	.235	.77	75	.444

GROUP 1 - ASD
GROUP 2 - AFALD

VARIABLE	NUMBER OF CASES	MEAN	STANDARD DEVIATION	STANDARD ERROR
Q12 TEST & EVAL				
GROUP 1	40	47.8500	23.139	3.659
GROUP 2	37	53.5676	22.164	3.644

POOLED VARIANCE ESTIMATE

F VALUE	2-TAIL PROB.	T VALUE	DEGREES OF FREEDOM	2-TAIL PROB.
1.09	.797	-1.11	75	.273

VARIABLE	NUMBER OF CASES	MEAN	STANDARD DEVIATION	STANDARD ERROR
Q13 GOAL CONFLICT				
GROUP 1	40	66.0500	22.985	3.634
GROUP 2	36	66.1111	27.201	4.533

POOLED VARIANCE ESTIMATE

F VALUE	2-TAIL PROB.	T VALUE	DEGREES OF FREEDOM	2-TAIL PROB.
1.40	.306	-.01	74	.992

GROUP 1 -ASD LEVEL II
GROUP 2 -ASD LEVEL I

VARIABLE	NUMBER OF CASES	MEAN	STANDARD DEVIATION	STANDARD ERROR
Q6 ORG STRUCTURE				
GROUP 1	19	47.3158	26.781	6.144
GROUP 2	21	40.7619	23.317	5.088

POOLED VARIANCE ESTIMATE

F VALUE	2-TAIL PROB.	T VALUE	DEGREES OF FREEDOM	2-TAIL PROB.
1.32	.546	.83	38	.413

VARIABLE	NUMBER OF CASES	MEAN	STANDARD DEVIATION	STANDARD ERROR
Q7 DPML AUTHORITY				
GROUP 1	19	58.4737	26.551	6.091
GROUP 2	21	43.0952	22.474	4.904

POOLED VARIANCE ESTIMATE

F VALUE	2-TAIL PROB.	T VALUE	DEGREES OF FREEDOM	2-TAIL PROB.
1.40	.469	1.98	38	.055

GROUP 1 -ASD LEVEL II
GROUP 2 -ASD LEVEL I

VARIABLE	NUMBER OF CASES	MEAN	STANDARD DEVIATION	STANDARD ERROR
Q8 LOG MANAGEMENT TOOLS				
GROUP 1	19	46.3684	24.379	5.593
GROUP 2	21	49.4762	16.663	3.636

POOLED VARIANCE ESTIMATE

F VALUE	2-TAIL PROB.	T VALUE	DEGREES OF FREEDOM	2-TAIL PROB.
2.14	.102	-.47	38	.638

VARIABLE	NUMBER OF CASES	MEAN	STANDARD DEVIATION	STANDARD ERROR
Q9 SKILLS				
GROUP 1	19	58.4211	23.025	5.282
GROUP 2	21	58.1429	20.910	4.563

POOLED VARIANCE ESTIMATE

F VALUE	2-TAIL PROB.	T VALUE	DEGREES OF FREEDOM	2-TAIL PROB.
1.21	.673	.04	38	.968

GROUP 1 - ASD LEVEL II
GROUP 2 - ASD LEVEL I

VARIABLE	NUMBER OF CASES	MEAN	STANDARD DEVIATION	STANDARD ERROR
Q10 WORKING RELATIONS				
GROUP 1	19	56.2632	28.482	6.534
GROUP 2	21	45.5714	26.284	5.736

POOLED VARIANCE ESTIMATE

F VALUE	2-TAIL PROB.	T VALUE	DEGREES OF FREEDOM	2-TAIL PROB.
1.17	.724	1.23	38	.224

VARIABLE	NUMBER OF CASES	MEAN	STANDARD DEVIATION	STANDARD ERROR
Q11 LOG DESIGN GOAL DEFINITION				
GROUP 1	19	72.6316	17.551	4.026
GROUP 2	21	70.9048	17.770	3.878

POOLED VARIANCE ESTIMATE

F VALUE	2-TAIL PROB.	T VALUE	DEGREES OF FREEDOM	2-TAIL PROB.
1.03	.964	.31	38	.759

GROUP 1 - ASD LEVEL II
GROUP 2 - ASD LEVEL I

VARIABLE	NUMBER OF CASES	MEAN	STANDARD DEVIATION	STANDARD ERROR
Q12 TEST & EVAL				
GROUP 1	19	45.0526	23.049	5.288
GROUP 2	21	50.3810	23.489	5.126

POOLED VARIANCE ESTIMATE

F VALUE	2-TAIL PROB.	T VALUE	DEGREES OF FREEDOM	2-TAIL PROB.
1.04	.942	-.72	38	.474

VARIABLE	NUMBER OF CASES	MEAN	STANDARD DEVIATION	STANDARD ERROR
Q13 GOAL CONFLICT				
GROUP 1	19	67.7368	25.309	5.806
GROUP 2	21	64.5238	21.179	4.622

POOLED VARIANCE ESTIMATE

F VALUE	2-TAIL PROB.	T VALUE	DEGREES OF FREEDOM	2-TAIL PROB.
1.43	.439	.44	38	.665

GROUP 1 - AFALD LEVEL II
GROUP 2 - AFALD LEVEL I

VARIABLE	NUMBER OF CASES	MEAN	STANDARD DEVIATION	STANDARD ERROR
Q6 ORG STRUCTURE				
GROUP 1	26	44.7692	26.973	5.290
GROUP 2	11	54.3636	30.021	9.052

POOLED VARIANCE ESTIMATE

F VALUE	2-TAIL PROB.	T VALUE	DEGREES OF FREEDOM	2-TAIL PROB.
1.24	.631	-.96	35	.345

VARIABLE	NUMBER OF CASES	MEAN	STANDARD DEVIATION	STANDARD ERROR
Q7 DPML AUTHORITY				
GROUP 1	26	64.9615	20.801	4.079
GROUP 2	11	61.0000	26.721	8.057

POOLED VARIANCE ESTIMATE

F VALUE	2-TAIL PROB.	T VALUE	DEGREES OF FREEDOM	2-TAIL PROB.
1.65	.299	.49	35	.630

GROUP 1 - AFALD LEVEL II
GROUP 2 - AFALD LEVEL I

VARIABLE	NUMBER OF CASES	MEAN	STANDARD DEVIATION	STANDARD ERROR
Q8 LOG MANAGEMENT TOOLS				
GROUP 1	25	49.8800	20.167	4.033
GROUP 2	11	40.9091	15.694	4.732

POOLED VARIANCE ESTIMATE

F VALUE	2-TAIL PROB.	T VALUE	DEGREES OF FREEDOM	2-TAIL PROB.
1.65	.412	1.31	34	.200

VARIABLE	NUMBER OF CASES	MEAN	STANDARD DEVIATION	STANDARD ERROR
Q9 SKILLS				
GROUP 1	26	59.7692	18.762	3.680
GROUP 2	10	53.400	28.155	8.903

POOLED VARIANCE ESTIMATE

F VALUE	2-TAIL PROB.	T VALUE	DEGREES OF FREEDOM	2-TAIL PROB.
2.25	.106	.79	34	.435

GROUP 1 - AFALD LEVEL II
GROUP 2 - AFALD LEVEL I

VARIABLE	NUMBER OF CASES	MEAN	STANDARD DEVIATION	STANDARD ERROR
Q10 WORKING RELATIONS				
GROUP 1	26	45.8846	24.494	4.804
GROUP 2	11	36.0909	29.814	8.989

POOLED VARIANCE ESTIMATE

F VALUE	2-TAIL PROB.	T VALUE	DEGREES OF FREEDOM	2-TAIL PROB.
1.48	.408	1.04	35	.304

VARIABLE	NUMBER OF CASES	MEAN	STANDARD DEVIATION	STANDARD ERROR
Q11 LOG DESIGN GOAL DEFINITION				
GROUP 1	26	62.9615	21.379	4.193
GROUP 2	11	81.0000	15.047	4.537

POOLED VARIANCE ESTIMATE

F VALUE	2-TAIL PROB.	T VALUE	DEGREES OF FREEDOM	2-TAIL PROB.
2.02	.246	-2.54	35	.016

GROUP 1 - AFALD LEVEL II
GROUP 2 - AFALD LEVEL I

VARIABLE	NUMBER OF CASES	MEAN	STANDARD DEVIATION	STANDARD ERROR
Q12 TEST & EVAL				
GROUP 1	23	53.0000	23.350	4.579
GROUP 2	11	54.0091	20.067	6.050

POOLED VARIANCE ESTIMATE

F VALUE	2-TAIL PROB.	T VALUE	DEGREES OF FREEDOM	2-TAIL PROB.
1.35	.635	-.24	35	.815

VARIABLE	NUMBER OF CASES	MEAN	STANDARD DEVIATION	STANDARD ERROR
Q13 GOAL CONFLICT				
GROUP 1	26	63.4231	27.363	5.366
GROUP 2	10	73.1000	26.876	8.499

POOLED VARIANCE ESTIMATE

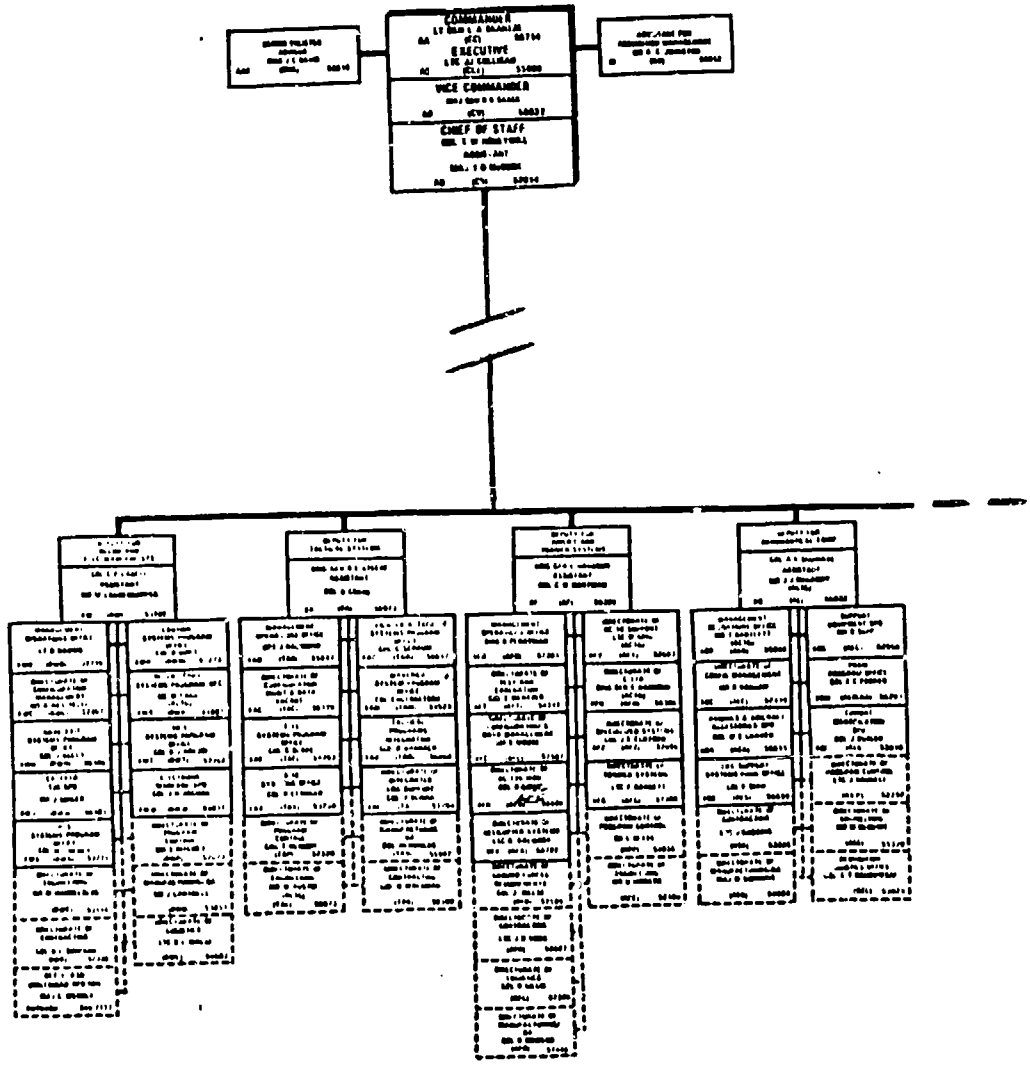
F VALUE	2-TAIL PROB.	T VALUE	DEGREES OF FREEDOM	2-TAIL PROB.
1.04	1.000	-.95	34	.346

APPENDIX C

ASD ORGANIZATION CHART

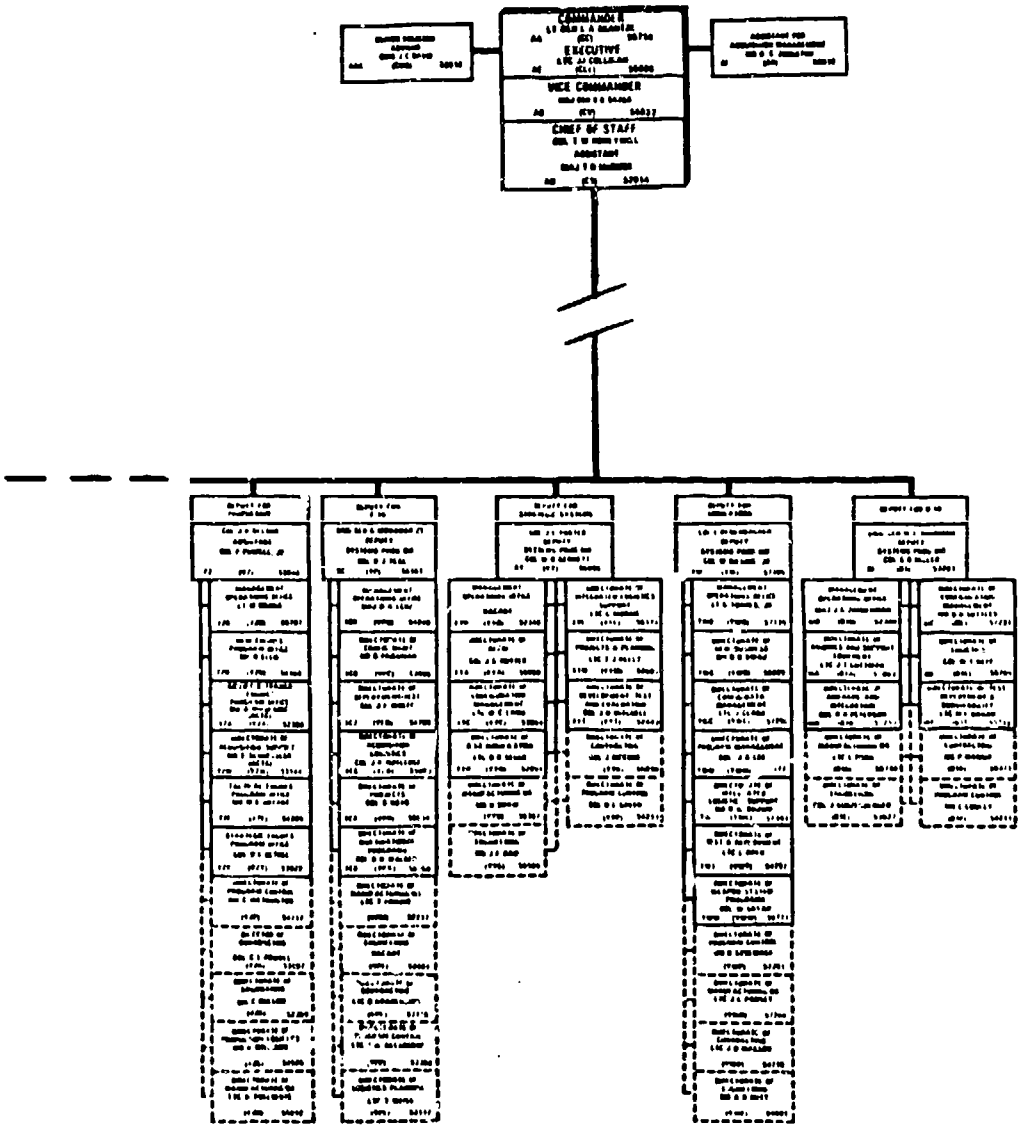
AERONAUTICAL SYSTEMS DIVISION

JANUARY 1982



AERONAUTICAL SYSTEMS DIVISION

JANUARY 1982



APPENDIX D

SAMPLE SELECTION CHART

Method:

1) Candidate offices meeting criteria (CHAPTER III) selected from ASD organization chart (Appendix C).
2) Offices ordered top-to-bottom, left-to-right order.
3) Offices randomly assigned an identification number.
4) Identification numbers were randomly selected.
5) The first 15 office identification numbers selected defined the sample population. (NOTE: No office from ASD/AE was among the 15. In a departure from the random plan, the first AE office ID number selected was included in the sample for balance.)

OFFICE SYMBOL	ID NUMBER	ID NUMBERS SELECTED	CORRESPONDING OFFICE SELECTED
RW	25	7	YZ
RWH	34	33	B1
RWJ	5	23	TA
RWS	6	2	YP
RWH	24	10	TAF
RWR	29	20	AF
RWT	31	26	AFN
RWN	3	3	RWN
TA	23	9	AFY
TAF	10	27	YZN
TAX	21	28	YYA
TAA	35	36	YZA
TAM	8	13	YY
AF	20	21	TAX
AFN	26	6	RWS
AFX	22	14	
AFY	9	35	
AFH	11	29	
AFZ	22	14	
AFG	1	34	
AE	15	30	AES
AEA	4	31	
AES	30	16	
AEG	17	11	
AEI	32	25	
YZ	7	18	
YZN	27	4	
YZA	36	5	
YZF	18	24	
YZY	16	32	
YP	2	19	
YY	13	15	
YYA	28	17	
YYH	12	1	
YW	19	8	
B1	33	12	

APPENDIX E

INTERVIEW RESPONSES

Organization of Comments

This appendix is a compilation of the comments each of the interview subjects offered as explanations of their rankings of the barriers to ILS. Also included are the subjects' selection of other "significant" barriers, and a list of general comments about acquisition logistics. The comments are not quoted exactly; rather, they are paraphrased based on the interviewers' interpretations of the comments.

The comments are organized within the eight categories of barriers assumed to exist for this research. The barriers are listed in the order they appear in the interview schedule (Appendix A). Within each category, the comments are listed in order of the significance each group attached to the barrier. Finally, the comments are divided by the sample groups: first ASD, then AFALD (the numbers preceding the comments identify the interview control number). For example, the comments related to barrier one, Organization Structure, are organized as follows:

1. ORGANIZATION STRUCTURE
   - A. SIGNIFICANT (impact on incorporating ILS)
     - (1). ASD Comments
     - (2). AFALD Comments
   - B. SOME (impact on incorporating ILS)
     - (1). ASD Comments
     - (2). AFALD Comments
   - C. LOW (impact on incorporating ILS)
     - (1). ASD Comments
     - (2). AFALD Comments

A typical heading for a group of comments is:

ASD 1. ORGANIZATION STRUCTURE LOW

ASD 1. ORGANIZATIONAL STRUCTURE SIGNIFICANT

112. DPML shops furnished by AFLC, so loyalty is that way. They abdrogate their acquisition logistics responsibilities. It is difficult to convince them they are on the team. The quality of people varies. The DPML should be at least as high as the projects group in the PMs eyes.

117. Logs are stretched between commands. New structure of DCS/AL should help.

132. Perceived status of ILS office must step out of second class citizen. This status should be legislated first, then ILSO must live up to new status.

134. Have trouble getting support for some projects from matrix personnel. Priorities are not in synchronization, particularly in formative programs.

146. Worked in ALD/ASD joint managed program, buying off-the-shelf equipment. This was the right structure for the program. The equal partnership allowed direct inputs. This should be generalizable to other programs, but goal conflict more likely due to more open and equal relationship. Our up-front planning led to a flexible support plan.

171. Related to working relations. The DPML must be involved in front office affairs. The dual chain is a personal problem of the DPML; it puts him in a box. His primary loyalty is to AFLC.

ALD 1. ORGANIZATIONAL STRUCTURE SIGNIFICANT

102. Rated organizational structure and DPML authority together. You have two different organizations with different but equal interest in the program which is managed by AFSC. Whenever tradeoffs have to be made, AFSC has the last say, implying a biased decision. A better organizational structure might be a HQUSAF PM with a DPM for logistics (AFLC), a DPM for system development (AFSC), and a DPM for the using command.

105. Beyond the goal conflict problems, the DPML interface is further diluted by the two separate command structures (and generals) whose charters are totally different.

107. The dual chain allows end runs. We can stop a program by going around the PM. PMRT is the real stopper. If AFLC says "no", there is no transfer.

119. Related to authority. Logistics is more important than just another four-letter office. The DPML should become the SM at PMRT.

131. We have to satisfy three bosses: the ALD, the airframe PM, and the engine PM. The dual chain never works to our advantage.

139. This office (logistics) is not recognized on the ASD organization chart. Within the ILSO there is a compartmentalization of skills and little or no crosstalk.

141. Awkward having AFLC write my ticket while I work for the PM. This intensifies the split feeling between ASD and AFLC. There is a communications gap between the ALD staff and ALD people in the SPOs. There is not enough communication. The DPML is pulled two ways.

160. Dual chain helps DPML get things done.

166. DPML should be colocated with the PM and have active decision making authority.

167. The present organization structure is one of the factors that contributes most to the success of ILS. The DCS/AL will be good for increased attention to logistics at HQAFSC, but I'm not sure how the DPML should be controlled. I also don't know if AFSC will get into other logistics issues, such as now considered by the JLC. Organization conflicts will remain because roles are not changing. The DPML cannot be a naysayer. He should be judicious in exploiting the dual chain of command. Successful managers cannot be dogmatic. They must have a perspective of overall goals (speaking mostly of mid-management). If DPML is sure he is right, he can bring some powerful forces to bear. The PM knows this, and if the DPML is on his team, he has a powerful ally.

182. On the front end of the program you don't get the logistics people you need. Structure has always been poor, and we are always undermanned.

184. Dual chain causes problems in redundant demands. I can't answer both bosses simultaneously. Generally find less of the divisiveness in the earlier phases. Competition for resources increases as the program matures. Problems are not insurmountable. They do not impede my performance except by dividing my time. Going through all the logistics channels slows down the process, and this could cause some reluctance among DPMLs to go through the logistics chain.

ASD 1. ORGANIZATIONAL STRUCTURE SOME

108. It is advantageous for the DPML to have an audience outside the PM chain to ALD/AFLC. This assures a hearing on significant issues.

111. The DPML is between a rock and a hard place. Working for PM but answerable to AFLC. His promotion potential is in jeopardy. Matrix organization creates "military pride" problems due to people feeling they are not part of the focal organization. Best organizations are straight line.

144. It's not really a dual chain of command; more in line with the matrix philosophy. If matrixed I am not assigned work by the home office. It is a mistake having performance reports written by the home office. The checks and balances are in the dual chain. If there is total disagreement between the PM and the DPML, the PM will sense it. The PM should then talk to the ALD boss. That higher authority in ALD then becomes a mediator.

161. ALD evolved haphazardly into some undefined role. They could help a lot in planning for PMRT by coordinating with the M.A. They have not helped facilitate a smooth transfer of engine programs to ALC. In fact, they have failed. Also, PMRT is difficult because the ALC program has responsibility for just the engine, not the SE and other functions. They don't have a systems approach to management. It would be much better if ALCs were organized along the ASD PM style.

165. AFLC organization gets in the way as far as time constraints go. For example, the PMD doesn't flow down to the ILSO as quickly as possible. It gets lost in HQAFLC or at the ALC. We're the last to know we have a program.

173. Dual chain is a good idea, but it places the DPML in an awkward position.

175. I don't agree the DPML is in a low power positon in the SPO. In our SPO, he's a three-letter deputy to the PM.

181. DCS/AL is a good way to get rid of AFALD. It could be a good idea, but it will start by allowing

AFSC to bury logistics concerns.

ALD 1. ORGANIZATIONAL STRUCTURE SOME

105. The dual chain often constrains the DPML as far as clear program direction.

110. We are in a modification program. We have no control over our logistics specialists. They are controlled by the SM at the ALC.

150. We tried having ALD and ALC people together in the SPO but it didn't work. One reason was the military grade structure. One O-5 from ALD wouldn't work with an O-5 from the ALC.

153. Some advantage to the dual chain. The DPML can use the AFSC chain to overcome intransigence in the AFLC chain. The dual chain is responsible for many of the improvements in acquisition logistics. Hopefully the DCS/AL will retain the dual chain.

ASD 1. ORGANIZATIONAL STRUCTURE LOW

115. Dual chain good overall. It would be dificult if the DPML had greater authority.

116. More dependent on the DPML than the organizational structure.

122. DPML is equal to other organizations, but not a deputy PM. The DPML needs to be a hard charger.

153. Not untypical of other AF organizations. Dual chain provides a bigger hammer for the DPML.

154. Not a factor. It's how well the organization is used by the PM. Logistics is an enigma to the PM, so he relies heavily on the DPML. The DPML carries a stigma from AFLC.

158. DPML at same level as other functional managers.

172. DPML is bogged down in the AFLC organization structure, which is not as streamlined as ASD. AFLC is too top-heavy, with layers of bureaucracy. They have six- and seven-letter office symbols. An issue must pass through ten layers of management before a decision can be reached.

174. With good people it doesn't matter where they sit. The dual chain is no problem. The answer is in a unified effort.

ALD 1. ORGANIZATIONAL STRUCTURE LOW

101. Advantages to the dual chain include an appeal process for the DPML. This assures at least consideration of logistics needs.

123. The DPML is at the same level as the PM in this SPO.

125. No problem. SPOs are classic organizations. What's important is how the DPML functions within the structure.

126. A minor problem, although the logistics specialists can be caught in the middle of a PM and a DPML

at odds with each other.

129. A lot has been said about the organization structure and that the DPML is a "creature of a different world." I haven't seen much evidence.

145. The constantly changing organizations have caused some problems.

147. Depends on the PM. There are individual differences. It's a matter of personalities to some degree.

148. All a function of individual interactions rather than formal organizations.

169. I've never seen it as a problem. It depends on the individuals.

179. Not important. The real authority is with money.

183. Our DPML is on par with other directorates.

ASD 2. DPML AUTHORITY SIGNIFICANT

132. The DPML must have faster acting veto power than through the logistics chain.

136. Authority is delegated by the PM. Effects are a function of the forcefulness of the DPML.

149. The ALD is just an advisory body.

156. Our logistics shop is manned by the ALC. The DPML is highly dependent on the SM; he has no inherent authority. The SM does it the way it has "always been done." The DPML acts primarily as a liason between the ALC and the SPO. The SM often says, "buzz off. That's our business."

157. This program is not sanctioned by the DOD. It is a stepchild with a low priority in the SPO. ALC has total logistics program authority, and they don't really consult the ALD. They are a separate entity and behave that way, independently. The PM is "hard-over" on logistics support, but he's not getting much cooperation from the ALC.

162. The problem is tendency of logisticians not to be aggressive enough. They are full of "gloom and doom" and don't appreciate the situation of the PM who is trying to satisfy many masters like the user, AFSC, AFLC, and ATC.

171. The DPML needs more input and coordination over program decisions, but not fund control. He should be a part of the process, but nobody has a "vote."

172. Logisticians lack decision making authority. They must check with a dozen different people to get a decision. They are tied up in their many regulations, and have no latitude. However, the DPML should have no control over program funds.

174. My DPML has authority in the SPO as my spokesman for logistics, but he can't speak for AFLC positions.

181. AFLC has a larger bureaucracy. Our major program has required rapid operation. AFSC can speed things up, but AFLC is too staff-heavy, with a rigid bureaucracy that makes expediting difficult.

185. Authority is a personal characteristic as well as a structural feature. We need individuals who take responsibility.

ALD 2. DPML AUTHORITY SIGNIFICANT

107. Military grade structure impedes authority. We have four-letter DPMLs dealing with three-letter PMs; O-5 versus O-6.

119. The DPML could control his logistics program better if support costs were split out in the budget and given to the DPML. There would be more emphasis on support then.

128. The DPML has "zero" authority.

131. The DPML must earn respect by establishing credibility. Credibility leads to authority.

137. An aggressive DPML establishes his own authority and esteem. We'll need this management philosophy until the PM is judged on his logistics achievements.

138. The DPML is not the OPR for anything. AFSC personnel dominate. They want aircraft out the door and on the field. Long-lead time SE and spares take second place. Political pressures drive this. I don't think the DPML should have "veto" powers, but he should have more input authority.

139. Logisticians are a nuisance to the SPO. The DPML isn't OPR for anything. AFSC personnel dominate this program due to its multinational status. It gets more attention and possibly more funds.

147. We have no control over funds. We can, at times, get recognition for our logistics needs, but there is much ebb and flow. Cost/schedule/performance were formerly the only standards, and this is still a problem sometimes.

150. If the DPML doesn't have authority, what good is he? The regulations give him authority, but he must assert himself.

151. Since day one, whenever projects and engineering agreed on a decision, that's the way it went. It doesn't matter what the DPMLs opinion is. As a result, engineering data requirements were deferred for eight years in this program.

166. We need to do a better job of giving the DPML a funding lever in regards to his program. The DPML needs knowledge of and sign-off authority over budgeting estimates.

179. Money is everything.

182. The DPML didn't have much say in the front-end of the program. It depends somewhat on the DPML's personal characteristics.

183. The DPML has no control over funds, but he should have some for things like reliability improvement warranties which can benefit AFLC in support costs. Trying to spend ASD money to save AFLC money doesn't work.

ASD 2. DPML AUTHORITY SOME

158. DPMLs do have authority, but sometimes do not take charge.

163. ALD was supposed to take on some acquisition responsibility, but they have become a stumbling block. With no money, they have no clout, so why listen? The only clout they have is "non-coordinating" action.

173. The DPML should have a strong voice in how the program is planned and strong inputs to the SOW and the RFP. But, there is only one guy in charge, the PM. He is accountable for the program, including logistics.

175. The DPML needs to make decisions, but he is not the PM. He should not have authority to make independent funding decisions. He should be able to make some decisions, and shouldn't be required to coordinate all his decisions with AFLC.

ALD 2. DPML AUTHORITY SOME

127. I'd rather have a PM with whom I have credibility. Authority and organizational structure are secondary.

141. Our DPML works in the front office (with PM). He has a lot of influence, but he is not as accessible to the logistics office.

153. If the DPML is articulate, he has all the authority he needs. Credibility is more important than formal authority.

164. The military grade structure is a problem. An O-3 DPML against an O-5 PM is no contest. The DPML cannot be objective. The PM has inputs to his OER, even though it is written by his ALD boss.

167. The DPML has to earn authority. The key is a person who can use his personal skills to gain authority, although he must not do this in a dogmatic way. The emphasis should always be on combat capability, readiness, sustainability, not on what is good for AFLC or ASD.

ASD 2. DPML AUTHORITY LOW

100. If the logisticians depend on the regulations to do their job, you are dead.

111. Authority not a problem if the PM treats the DPML right. While the DPML has a strong line to AFLC, I can't envision this causing a adversarial relationship.

113. The DPML has as much authority as he wishes to exercise, and he is aided by the dual chain of command. My DPML writes weekly reports to his ALC.

122. Funds expenditures are approved by the CCB, and the DPML is a member of the CCB.

133. The authority is there if the guy wants to take it.

142. Formal authority is not as important as personal characteristics in the DPML. Aggressiveness in the DPML is essential. Otherwise, the PM puts logistics out of his mind.

144. Any functional office is only as good as its people. Initiative yields all the authority and importance a man needs. Each function in the SPO is equally important, and authority derives from the functional responsibility.

154. The DPML carries a stigma from AFLC. Authority is not so much the problem as how the DPML is used by the PM.

180. Good DPMLs haven't had problems of authority.

ALD 2. DPML AUTHORITY LOW

118. Logisticians have too many bosses.

129. Not a problem. The DPML is a member of a team. This SPO may be different because we are a "basket" SPO.

ASD 3. LOGISTICS MANAGEMENT TOOLS SIGNIFICANT

130. The tools are relatively new. I have reservations about LCC. The proper people do not support it. Often the SPO would advocate LCC applications, but the logisticians either weren't involved or didn't see the applicability. "Liars" play with LCC models. This affects the basic credibility of the model results. Lessons learned tend to be ineffective, such as those related to business strategy. There is a tendency to copy lessons rather than apply them intelligently, like using the C-X strategy for the NGT.

149. These tools have limited effectiveness in a production program.

159. There is not much confidence in the latest tools developed. We generally apply "benign neglect" to LCC predictions for source selection and budget projections.

ALD 3. LOGISTICS MANAGEMENT TOOLS SIGNIFICANT

107. The regulatory guidance on managing ILS is written wholly for major programs, and is too demanding for small programs. We must apply LCC, LSA, etc. to every program without exception. Forcing this on small programs is incredible. Costs frequently exceed the benefits gained. There is a lot of redundancy in tools like LSA. Some of the data is available in other DIDs.

126. With the new LSA handbook (MIL-STD 1388), LSA can work now. It is a lot better than previous versions. It gives a common logistics data base for all.

148. We get a lot of inconsistent guidance from very high levels. Before we can commit $100K for SE, we must perform a Decision Tree Analysis (DTA) to determine contractor versus organic depot support. If the DTA shows organic depot support, we must then perform a Depot Interservicing Analysis to determine which depot will support. All this wastes time and money. Configuration audits are another example. They are required, but almost impossible on large systems. LSA is evolving and constantly changing. There are no experts except on the outdated methods. We've had two changes in the last two years. LCC is a good tool for some things, but for SE the budget estimates are a pure "WAG." LCC on SE requires more firm hardware data for timely decisions up front.

151. Projects and engineering people view the tools as useful if they give the "right" answer.

167. ALD people are not well skilled in cost models. The most skilled application I have seen was performed by an accountant from AC, not by a logistician.

179. LCC is a non-existant management tool. Contractors pay lip service and ignore the requirements in the contracts. I've advocated leaving the requirement out of contracts, but PMs insist on leaving it in because HQ says so.

ASD 3. LOGISTICS MANAGEMENT TOOLS SOME

108. Tools are more applicable to larger programs.

111. LCC depends on having someone capable of doing it. In-house efforts are a function of manpower and skills. If we can't do it, we will pay the contractor to do it at significant cost.

112. Not much attention paid to LCC. It is supposed to be the DPML's responsibility, but he doesn't do a great job of focusing the PM's attention on LCC or lessons learned.

172. LCC has assisted in decision-making. We will probably decide on contractor versus organic depot support based on LCC predictions.

173. The best lesson learned is that it is foolish to sacrifice logistics for performance if you can't use the system. For LSA, if the design engineer is not deliberately aware of the impact of his design on ILS elements, no "accountant" who isn't a designer will be able to assess how well the engineer is doing. Need logistics engineers who are as skilled as the system engineers.

174. I don't believe in the lessons learned program. It stifles innovation. I'm not interested in old solutions to new problems.

175. Lessons learned repositories are not used as much as they should be, due to the time involved in reviewing them. They are not easily accessible. Computer files would work better. There are probably valuable lessons, but they are not often looked at.

185. Tools need to be used the right way. When they are used correctly they are valuable.

ALD 3. LOGISTICS MANAGEMENT TOOLS SOME

119. LSA is computerized and people are afraid of computers.

125. LCC cannot be measured. It must be extrapolated. Projections aren't worth a damn.

131. I've used all the tools and the lessons learned, but most of my management-oriented lessons have come from other people, based on their experience.

137. DTLCC is a good method to insure consideration of O&M costs. If the logistics goals are defined well to begin with, the tools will be worked in.

147. Use is a problem in small SPOs because tailoring is difficult. In some cases we shouldn't be using them because the costs exceed the return we get.

153. LSA should be applied to all programs, and it can be tailored. If the contractor already has a support data base, we can use that and interface it with LSA by tailoring.

155. LCC is misused because it is not tailored to the program. More emphasis should be placed on the analysis of assumptions, applications, and limitations of the models. Also, there is not enough time nor manpower to use LCC correctly. Most lessons learned are program-peculiar and not generally valid for other programs. We need guidance telling us what to do with an LSAR, such as an AFP or some direction on how to set it up. There is pressure to apply LSA without regard to costs or benefits.

160. LSA helps identify up-front data we need. It works nicely on large programs with lots of manpower. Tailoring is done, but because of a lack of manpower we spend too much for meaningless information. We ask for more than we need because we are not sure what we do need, and to avoid criticism later.

164. We are required to have LSA and some LCC, but we can't always justify the expense. From LSA we were getting only the input sheets, no outputs, no useable data.

166. The tools are there, but the people with skills to understand them aren't. Need a training course in LSA/LCC that tells us how to do it, not just what it is.

182. The only LCC model we used on the fighter program was for O&S costs only, and only one time in three years did we use it. The AF doesn't understand what we are looking for in LSA. We are using the Army's ideas. We need to grow our own ideas. I'm not impressed with lessons learned because the most valuable ones are kept in the heads of people. One lesson we can't learn is that we keep buying all the reprocurement data packages, and we don't need them all. This costs money and is wasteful.

ASD 3. LOGISTICS MANAGEMENT TOOLS LOW

106. Garbage in-garbage out. In the production phase, decisions are not based on these tools. Their usefulness depends on the phase of the program.

133. I've seen good and bad applications.

142. The tools are not well defined, and the people who use them are not experienced enough.

144. No credence in the results of LCC models. There is no data that validates the results of any LCC analysis results over a 20-year life cycle. LSA is worthless in the early stages of a program, because most of the details are too vague, abstract.

158. Tools are not used due to a lack of skills. If I had skilled logisticians the tools would be used better.

163. They aren't taken seriously. There is a lack of confidence in outputs from tools like LCC.

171. Not sure of their benefit.

180. The tools are imperfect and many assumptions are required to use them.

181. LCC is a little flakey. We need good people to do it. Business management types don't want the responsibility because of its reputation.

ALD 3. LOGISTICS MANAGEMENT TOOLS LOW

109. I'm not sure of their effectiveness, but they are being used.

110. LSA formats are incompatible with the computers in AFLC.

135. I haven't seen the tools used effectively yet. It took me three years to understand LSA.

145. Tools are reasonably well accepted. Our contractor examined LCC as the program developed. We had a DTLCC program with some positive aspects. We have a dilemma with LSA, though. Our's is 50% complete. Recently, the using command changed the airplane mission profiles. This could affect supportability, but starting the LSA over is too expensive. Not doing the LSA over may cause problems later in TOs, RLA, SE, and provisioning.

169. The tools are helpful if done in reality, but so many times they are "worked" until the "right" answer comes out.

ASD 4. LOGISTICS SKILLS SIGNIFICANT

111. AFLC is not manned for acquisition logistics. Acquisition logistics implies early involvement from users, testers, and logisticians. I'd pull AFLC into the development early. On the A-X I wanted logistics inputs early, but it never happened. ASD R&M people were involved early, but they have a different perspective. The logisticians didn't get involved even though there was prototype hardware available. Logisticians like "paper airplanes" and they have plenty of analytical skills. This was true before ALD was created, and it's true now.

115. Skilled logisticians make all the difference. I can't survive on PACE trainees. There are very few skilled logisticians in any flavor: maintenance, spares, acquisition logistics. Quantitative skills are not too important. We don't need logistics engineers; let systems engineers do that.

116. ALC and AFLC people have no training for SPO work. Need to get good logisticians early in the program.

117. Logistics is losing experience at a time of great need. We've hired on a bunch of new help with less operational experience.

130. The SPOs do not have the necessary skills in logistics, so we must rely on the contractors like the engineers depend on the company designers. The ALD staff is not very responsive, not very available. They are in the ivory tower and they do not work. They stay there for good ratings. The hardworkers in the SPO get worse ratings.

133. Good people do not stay in the SPOs at the front end because of the frustrations in trying to get the ILS program started. Different skills are needed at different phases. People need not stay throughout the program, but tenure should be measured in years, not months.

136. Get the logisticians in early. ALD will not commit poeple until a contract is let. This is "ass backwards." We also need people who are willing to work.

142. There are certain times when you shouldn't change the logisticians assigned to the program. At source selection we didn't have the right manpower working. Those who helped develop the specifications and the RFP weren't there. There weren't enough logisticians there, and the ones we had were generalists. We needed some specialists.

143. I don't understand a lot of the logistics stuff, and the logisticians have an inability to explain what they are doing to the PM. I suspect they don't know it well, either.

149. Logistics skills are lacking acong ASD people. ASD people come in new to logistics skills. They need general logistic skills or some ALC experience.

154. Need different skills in the logistics shop. More systems thinkers.

158. Because we are involved with FMS we don't get the best people. Imagination and innovative skills are needed, along with logistics experience. We get a lot of 2Lts.

161. I've worked in many programs. 75% of the logisticians do not possess the skills to support the PM. The people assigned to ALD are not given a clear idea of their objectives. This guidance shouldn't have to come from the PM. The logisticians are supposed to know how to tailor their requirements to support the SPO goals. The logisticians should be able to provide alternatives to decisions that affect them. A data call is a good time to discuss alternatives. The logisticians tend to hold back for early decisions from the PM, such as what the maintenance concept should be. Before the RFP they need to tell the contractor what they want, otherwise the contractor can't price it. Once the logisticians know which way they are going, they are good at doing LCC and spares computations. If ALD people are asked what the purpose of ALD is, they can only give you a mission statement. ALD has had only some degree of success in implementing ILS. The answer is better training and more experience. I perceive a need for an acquisition logistics short course at AFIT. New ALD people are like "fish out of water." They cannot actually sit with the PM and discuss concepts or ask the conceptual support questions. I will say they are learning about commercial practices well. The types of skills they need are trainable. Field experience can be very helpful for a perspective on logistics. The ALD people are intelligent, but they are not given the right tools, training, and guidance.

165. The "basket" SPOs are always getting FACE trainees, then losing them after a year. After this cycle repeats several times, it gets discouraging. Why invest my time to train them, then lose the person? Need stability in logistics manpower, and logisticians with broader DoD experience. I recommend they go to school half-days for the first six months, and also go TDY to the ALCs.

173. We (ASD) do not realize the later impact of logistics needs. This depends on the experience level of the logisticians. A lot of Lts run programs and are unaware or don't appreciate the needs of logistics. They have no operational experience with which to judge impacts. But even when the PM sees the impacts, the fiscal constraints will inhibit the decision process.

175. Must have skilled people, skilled in the logistics process and acquisition management.

ALD 4. LOGISTICS SKILLS SIGNIGICANT

107. Overall manning is the problem in small programs. The lack of manning (five logisticians on 86 programs) prevents applying logistics requirements except by priorities. We apply ILS on the most important programs. ALD staff can help on a spot basis, but it often takes more manhours to train them on how they can help.

119. There are not enough logisticians at ASD trained for acquisition logistics in the SPOs. ASD and ALD are not doing enough to keep experienced people or to train the inexperienced. Also, the logistics skills are needed early in the program.

129. Most of the staff and the DPMLs are military and lacking in logistics background and training. There is no real career progression for acquistion logisticians, and all the training mechanisms are too general in nature.

131. Logistics skills are generally not available. The ALD staff is often needed, but they are no help. We have tight time limits on SOWs, specifications, and CDRLs. We must think fast and work fast. We have called on the ALD and AFLC staffs for help, but this is frustrating because the are not knowledgeable, interested, aggressive. A big problem is that we do not bring good loggies in early in the program. The types of experience we need are in acquisition logistics, and types who have lived with the delivered products. It is particularly hard to get skilled military. We've had good PACE trainees, but it would be very good for us to have people with both systems and logistics experience.

135. The problem is a function of little training and little experience. ALC people may have tunnel vision.

138. Certain skills do go with certain phases. 2Lts shouldn't start in SPOs; they need practical experience. In our logistics shop we have started to team 2Lts with more experienced people. Civilian retention in the SPO could be a problem. If a civilian gets a "bad" assignment, he has the perogative of leaving in one year. Good people will exercise this perogative. This could be construed as abuse of the system from an organization's point of view, and perhaps should be curtailed for the good of the organization.

145. This program has been more of a training ground. No stability in personnel. Early on we could do only general planning because our skills were "siphoned off" to "favorite son" programs.

148. Good programs have experienced and skilled logisticians assigned. Experience is needed in acquisition. In small programs the rapid development process helps the learning process. Logisticians can see all phases of the acquisition cycle. Ninety percent of logistics planning has to be done before source selection. Need acquisition skills and conceptual skills to plan for such things as acquisition strategies, incentives, and guarantees.

150. Without the right functionl people up-front, you are behind the power curve. The ALC provided people early with great success. We also had a logistics cadre at the contractor's plant, and that worked fine.

151. It is difficult to find five out of 250 people that are experienced enough to talk to in ALD. Skills and experience are also lacking at ALCs and at the contractors due to turnover.

160. There is a definite lack of training of logistics managers on what LSA and the other tools are. There is also a lack of R&M expertise.

164. It takes a long time to bring logisticians up to speed. We get trainees in and they are gone in a short time. It also takes a long time to get trainees into AFIT classes. When classes do come available, higher-ranking people go instead of trainees. One of our trainees was even dismissed from a class by an instructor because the trainee didn't have enough experience.

166. Analyses should begin early with the right talent, which is limited. There are not too many who really understand logistics analyses.

178. Logisticians need logistics management skills plus field experience. This is particularly important for evaluating SE.

183. There is too much turnover. We have no corporate memory from one program to the next.

ASD 4. LOGISTICS SKILLS SOME

100. We need the numbers of people who are willing to work. Skills are secondary. Send me a "warm body" and I can get something done.

108. "Basket" SPOs need skilled and versatile logisticians because a few people must handle many programs and many ILS elements.

112. In general, DPMLs are not manned with as good people as ASD. Should exchange officers between commands for "experience trades."

122. SPO business is a crisis business. Logistics issues do not reach a crisis stage early, so we need an experienced DPML to recognize logistics impacts early and help us avoid down-stream mistakes.

132. With the right leadership and guidance, people will do the job.

134. We are missing the conceptual thinkers in the early stages, and we lack the appropriate skills in all phases.

144. Logisticians require "individual" experience, not necessarily in logistics or acquisition. We need somebody who is a "practitioner." ALD and the other colocates have to translate between the PM's desires and AFLC desires. They have to have the experience to "pick and choose" the right time to support one position or the other, using wisdom or a sense of "rightness" about an issue or problem, based perhaps on "life" experiences. They (logistics) have as many smart ones as we do.

162. Most programs don't have many people to input a field point of view.

163. I look at logisticians and don't see the background in acquisition, but rather a very narrow point of view (like an IM at an ALC). This gives the PM less confidence in the logistics manager.

ALD 4. LOGISTICS SKILLS SOME

124. We need logistics generalists in the DPML slot.

127. Previously, we had no skilled acquisition logisticians to help the PM. Today, we have professional logistics societies, and people who have worked in more than one program. We are getting good, experienced people.

139. Most military are 2Lts. They need field experience before they are sent to work on acquisition programs. The civilian perogative to move around at whim hurts corporate knowledge.

147. There's always a shortage of personnel. With the resources available, we do well. DPMLs carry a 27XX AFSC. It would possibly be better if they had logistics AFSCs. The ALCs don't have much acquisition experience beyond buying spares.

153. We don't have the skilled people. Everybody in acquisition should have had to use the product. Too specialized people tend to have tunnel vision. I prefer a technician over management types, and I prefer mature people.

167. The best people are motivated and skilled. Next best are people who are motivated but unskilled. No one ever gets all the "right" people. We should be willing to put good (if inexperienced) people in the big programs to have time to "grow" them. The boss needs to be willing to live with their mistakes, though. There is no such thing as a "hand-picked" operation.

169. We lack continuity of people which is critical to the success of the program. The personnel system is part of the problem. Military people must move on to get promoted.

179. We are capable of planning the logistics support. The whole problem is funding the effort.

182. DPMLs don't get people who are familiar with acquisition programs. We get specialists who have tunnel vision.

184. I'm getting good work from young people who are short on experience, but they are energetic.

ASD 4. LOGISTICS SKILLS LOW

No comments.

ALD 4. LOGISTICS SKILLS LOW

118. As an organizational factor and a contributor to goal conflict, you have professional engineers (ASD) versus professional logisticians. Also the grade structure is different. On average it is GS-14s versus [illegible] and 13s. That is no contest.

125. The ILSO needs analytical support skills and technical expertise, mostly depot types. You also need "blue-suiters", particularly in TOs.

128. Whenever we need a particular logistics skill we can get it.

137. Logisticians must be there when the program starts. Skilled logisticians are not unimportant, but less so than their mere presence.

ASD 5. WORKING RELATIONS SIGNIFICANT

116. If a guy knows his stuff, has broad skills and a feel for the system, he will be able to get good feedback on technical problems from guys in the field.

121. Personal problems can prevent mission accomplishment. No amount of skills or tools will help if people in your office won't share them or tell others about them.

132. This is the key to a successful program. Good personal relations yield good communication and esprit-de-corps.

133. Problems exist, and they are double-edged. ALCs, ASD, the labs, and ALD all talk different languages, causing misunderstandings and non-communication. Logisticians often go into a shell if, for example, they get thrown out of a meeting for saying something obscure or irrelevent. Many ASD guys don't want to work on the "-ilities" early in the program. They'd rather wait until FSD. But the

logisticians should be working early.

134. In new development, there is a lack of communication on overall program plans. Logisticians are slow in coming up to speed. The initiative goes to the PM to bring the logisticians on board. Logisticians are more concerned with current hardware and tend not to get involved in new initiatives in the program.

143. The people of AFLC are like foreign nationals. Things are done for the best interests of their "other" boss. This is the human frailty of a person working without his boss colocated.

144. Its the nature of the job at ASD. Everybody must be able to work with everybody, be able to stand up to criticism and not take things personally. People should be able to see the merit in counter-arguments to their own positions. There is a wealth of experience at WPAFB, but many people seem to think their ideas are best. I recommend that ASD and ALD share their ideas and problems, but this is not being done. Formal briefings do not work, and formal lessons learned do not work. What's needed is the ability to communicate, cooperate, learn. Cross-talk could make up for the lack of particular skills and experience.

158. The logisticians sometimes have to be dragged to meetings they should be attending. They don't show any initiative to be "on the team."

171. The logisticians must be involved in the program environment. Even if not equipped with the right people or the tools, they can still cope if they are involved and informed (especially the "top loggie"). Without good working relations, nothing else will work. The physical proximity of the DPML to the PM is essential. Communications depends on the PM relying on the communication from the DPML.

175. Always a factor. The lack of working relations will wash the other factors out. People cannot work independently in a large SPO. This contributes to non-productivity, time delays.

185. Need effective logistics management and coordination from the top down in the SPO, due to the different, often conflicting directives the players have. It is imperative the communications be strong.

ALD 5. WORKING RELATIONS SIGNIFICANT

120. My experience in three SPOs reveals this is a significant problem. The status of a logistician is relegated to the point of pure harrassment. You are an outsider and only tolerated because of directives. Most SPO directors recognize the need for logistics, but relegate its importance to basement status. Cost, schedule, performance reign supreme, and logistics suffers.

125. The DPML must have access to the boss, and he must have credibility. Experience from a using command is the best credibility measure. The DPML must also have credibility with other offices in the SPO, with the users, and with the contractors. He also needs close relations with the ALD staff.

126. Partially a part of any problem.

131. To ASD, there is a stigma attached to ALD, much like the stigma the engine SPO has with the airframe SPOs. Bad working relations can kill a program. I want to see ILS with emphasis on "integrated." If we do jobs entirely by ourselves, the job will be done poorly. There is no need for definitive divisions of labor. On TOs, PMRT, and flight test support we can help each other. We're doing some normal ASD functions, and ASD is doing some normal ALD functions. In TOs, however, all

responsibility should not be to ALD. The engineers must be particularly interested in the TOs.

145. In our office, the ALC appointed the ILSM, while ALD appointed a logistician to coordinate with the PM. Votes between the two AFLC organizations were often different. Both agencies wanted control of the program, so there was hostility to ALD from both ASD and the ALC. ALD has become defensive. There is a natural friction between the ALCs and ASD, especially at source selection. Each agency wanted a different engine. Communication was lacking all around in this office. Neither the ALC nor the PM would answer each other's correspondence. After the new PM got involved, things did improve. Logistics got more attention after the production decision.

165. The DPML sitting with the PM makes a big difference in working relations. We are more attuned to what is going on. We can pick up stray comments that are useful. This leads to more harmonious teamwork, more dialogue.

167. Communications outside the SPO are equally important. We need to draw other agencies (contractors, users) into the acquisition logistics arena, due to the manpower limitations in the SPO.

ASD 5. WORKING RELATIONS SOME

154. This has always been a problem because we do not get the best people in the DPML position. DPMLs show a lack of initiative overall.

165. There is a lack of reasonableness among the logistics people. ALD is bound by irrational, wrong, or inflexible rules. This causes difficulty in trying to cooperate with and communicate with ALD, ALCs, and AFLC. But, within the SPO there is no problem because the ILSO and the PM sit together.

ALD 5. WORKING RELATIONS SOME

102. Not much can be done about it because working relations cannot be dictated. Continuing interface with other functional offices and a strong desire to get the job done by all concerned is needed to overcome this.

127. It's related to skills. We're getting good logistics people and good PMs, so work relations are improving.

135. It's a problem in some offices. Informal information flow is important. You can learn more by overhearing a conversation than by going to a meeting.

138. If an aggressive individual works by himself, trying to "make a name" for himself, and doesn't share his knowledge, this causes ineffectiveness. Military people often take good knowledge away with them when they leave.

151. Depends on the individual's initiative. The logisticians must gain the confidence of the PM.

ASD 5. WORKING RELATIONS LOW

108. In this ("basket") SPO, there are seven logisticians for 50 to 80 programs, with 30 PMs. Logisticians have to be involved energetically. They have to communicate well.

111. Every good PM works all his divisions equally, colocated or not. I demand inputs from the logisticians for all projects that affect them. I require the logisticians to articulate reasons for their inputs, but the PM has to make the decisions. The technical portions of the program move swiftly with respect to the logistics needs.

112. I don't see problems here, with a few individual exceptions.

142. No problem.

146. The organization structure of our program (when it was a jointly managed ASD/ALD program) minimized the possible effects of bad working relations. We both felt an equal committment to the goals of the SPO.

159. I sense no communication problems. Our organization is small and the "crew" has been around for many years.

172. Where there are competent people dedicated to getting the job done, there is good communication. The major problem is layers and layers of management in AFLC.

ALD 5. WORKING RELATIONS LOW

123. Work relations are a problem between this SPO and the airframe SPOs. Communications to other agencies outside the SPO, like contractors and other SPOs are sometimes difficult due to parochial interests.

128. Bad working relations derive not from the organization structure, but from personality conflicts.

137. It's a management problem mostly. If other problems are taken care of up front, then working relations won't hurt you. If not, they will compound your other problems.

147. Logisticians are recognized as members of the team in this SPO.

155. Strictly a personality thing.

160. People work together pretty well. Logisticians are normally integrated into the SPO well, except for a lack of control over the purse strings.

182. I don't see a lack of communication within the program office. The DPML needs credibility. ASD is very ignorant of logistics. AFLC seems like a "puzzle palace" to them. There is too much bureaucracy to work through. There is more concern for logistics now, but money constraints overrule.

ASD 6. LOGISTICS DESIGN GOAL DEFINITION SIGNIFICANT

100. You must know what you are trying to do. The goals are set by AFLC in the PMD and the RFP. I haven't seen a good definition of goals yet. I get strictly qualitative garbage. The logisticians don't know what they want in quantifiable form. The required manpower for support is not quantified. Everybody thinks there is an infinite pool of manpower out there. LSA analysis after the contract is let is useless.

106. It is a difficult process to define down-stream logistics goals

108. We need operational people to look at logistics support programs and decide on the logistics goals, like the maintenance concept. We have trouble doing this. There is also a problem with multiple-command users of a product, such as a product from AE. It's hard to find an OPR, and even harder to get a unanimous decision.

111. There are different criteria for different aircraft and uses. Sometimes we have to trade performance for reliability. This is often evolutionary, and we can see the good trades as the program matures. The contractor does some of the work because the using command is usually at a loss as to what good supportability goals are. If the skilled logisticians are available they can help evolve the goals in dealing with the contractor.

113. Nobody can identify specific logistics goals. All we get is "motherhood" statements.

122. Design to acquisition cost (DTC) subordinates the necessary logistics goals. The fighter canopy was designed that way, and it wasn't tested adequately.

132. It is particularly important to define the goals and give incentives to the contractor to meet those goals in the validation phase.

136. We must have defined logistics goals and R&M requirements, and translate them into support requirements. The logisticians should manage R&M, not the design engineers. The cargo program used models to develop all R&M requirements from the user's specifications.

142. We have lots of trouble defining requirements for the source selection. Neither logisticians nor contractors trust the figures. There is much difficulty agreeing to definitions of terms like "reliability", as well as decisions on how to collect data to verify the test results. The present techniques for generating data are unreliable, and the people doing the collecting and analysis are inexperienced, as are the contractors. Skills are a problem. We need to assign logisticians to programs for a long time to keep the expertise. We can use specialist help from the ALD staff as required.

144. There are different phases to programs. In development we are concerned with the feasibility of meeting a threat, and assume supportability is possible. If the threat is big enough, we will go to any lengths to meet it. We often have difficulty between the user and the developer in getting good design specifications. User "requirements" are often based on current systems. The developer must use judgement on the feasibility of meeting those goals, because state-of-the art systems may be more unreliable at first than older systems. We have no way of matching MMH/FH to reliability. Reliability is hardware oriented, and we have too many definitions of reliability. Logistics support should relate reliability and maintainability. In development, we would need micro-management to determine MMH from reliability factors. We do not get any "hard numbers" from R&M. We need to put "hard numbers" in the specifications and also assure they are testable.

154. The fighter was driven by DTC. There was a conscious lack of consideration of developing logistics goals early on. Most goals are driven by system performance. The maintenace concept defined by the user has a big impact on the logistics design parameters. Maintenance concepts are not thought out, so the SPO must "flesh them out." The users don't understand development, and there's not enough dialogue between the users and the logisticians.

156. There is difficulty translating requirements into contractors' language, and we have difficulty checking if the contractor has all the required SE he needs to test and verify. We end up behind schedule as we try to get agreement on what the goals mean.

158. The contractor debated with the AF on who would do the logistics planning in the program. The

contractor wanted to do it. The SPO logisticians played a small role, so AFLC jumped in. This led to conflicts between AFLC and the contractor.

161. Acquisition logistics is full of good "motherhood" statements, but still we keep R&D budgets low. This prevents some of the goals of up-front logistics planning and design.

162. Goal definition leads to funding estimates. But, because of funding limitations and priorties, logistics falls out.

163. It is so hard to quantify the logistics requirements.

165. Needs to be done up-front. It is easier to do with qualified logisticians. It's too late if you wait for T&E to decide what the requirements will be.

172. Logistics goals have not been defined on this major program, and we have sent out the RFP. No decisions on the maintenance concept were made by the RFP suspense, so it was difficult to evaluate and price the proposal. We had to go with an assumed maintenance concept.

173. Logistics goals are hard to quantify, and it is hard to predict logistics support requirements. We tend to underestimate. So, even if we had more funds, logistics would probably come up short. The tendency would be to improve performance or compress the schedule. It is hard to transfer logistics considerations into design (due in part to the inadequacy of the quantitative tools) and have a way to control and measure the criteria. There are too many methods, and too little understanding.

174. There is no unified direction at the Pentagon. PMDs are not coordinated with the support side of the house.

175. We need requirements and directives. PMDs give general outlines of requirements, and we have to "flesh them out" in the SPO. The SPO is actively involved with PMD generation, so there are no surprises.

181. Numbers that reflect actual mission capable rates can be gamed to show what we want them to show. So, we can usually demonstrate we have met design goals even if we cannot. If the PMD is specific on R&M goals, the PM will "scream bloody murder" that we will blow the budget if we are forced to comply with the requirements. AFSC purposely strives for PMDs that are vague on logistics goals.

ALD 6. LOGISTICS DESIGN GOAL DEFINITION SIGNIFICANT

101. This is the most serious problem in ASD. There is no way of making tradeoffs, no way of assuring and verifying MMH/FH. Goals should be stated as clearly as possible in PMDs. "Hard" numbers are better, but quantifying them is hard. The SON should be the enforcer, with good logistics goals. A good example of a "hard" requirement was a statement in a PMD that the aircraft must be supportable at the FOL for thirty days with one C-130 load of materiel. Other support parameters can be derived from a "hard" requirement like that.

123. It is very diffult to specify good goals, and it takes a lot of effort. It is related to the skills of the people you have to do the work. The techniques of quantifying goals are in infancy, but we are making some progress. It would help if more logisticians knew about the source selection process. This would help them to frame and evaluate their goals.

124. Goal definition, goal conflict, logistics skills, and tools are all tied together. If the

logisticians don't know what to say or do about goals and requirements, they soon lose credibility with the PM. The goals should come from anywhere you can get them: users, designers, anything that will form baseline for analysis. But we need flexible goals from the top to allow latitude in applying them. Everybody ought to participate in developing design goals for logistics.

126. Specifying logistics requirements is hard even when we are buying a real-time engine events recorder and monitor. We can't get a concensus on what is important.

128. Anytime there is a requirement stated, the contractor pays attention. The requirements must be measurable, and the PMD must be the first step in specifying requirements. The definitive requirements are not in the PMD. We should use warranties and guarantees to enforce and measure performance.

129. Requirements are extremely difficult to translate into contract requirements. To assure reliable systems we should 1) assemble the POM to insure future buys, 2) have long, stable production runs, and 3) have good feed-back of lessons learned to the contractors.

131. Nobody knows what they want. We need good parameters for the FSD phase. This is the logistics "bread and butter", particularly in the engine business. The right skills early in the program insure good goal definition.

135. We don't do a good job. We tend to confuse requirements and goals. Goals are "nice-to-haves."

137. The requirements are needed at the front end of the program.

141. We have trouble being visible at the front end of the program to specify what we want from the contractor. The problem is that we place too much emphasis on field problems. We are working today's problems rather than tomorrow's issues. Logisticians are looked on as supply problem solvers instead of as long-term acquisition design workers.

147. Design parameters remain elusive. We are making strides in R&M and supply factors, but it is a slow process. Logistics doesn't stack up with other issues; it is still "back burner" stuff. Reliability should be specified in terms of operating hours rather than flying hours for avionics equipment. It operates longer. Technological breakthroughs cause historic data to be obsolete, but the users don't believe this. We still get requirements that are too pessimistic.

148. You must assume a reliability to come up with a maintenance concept and to form a budget. This is putting "the cart before the horse." Frequently, goals are essential early. They must precede the LSA and the LCC.

155. We don't get the right people in time. Even if we do specify our requirements the contractor will price them to kill them.

160. All good intentions get way-laid because of how the initial paperwork is laid out. Requirements get clouded in "boilerplate" RFPs. There is not a central core of people capable of specifying what we want in testable, quantifiable terms. Industry will give us what we want if we ask for it.

164. We get the PMD after the PM gets it. Our copies are usually lost in HQAFLC, or distributed to the ALCs, who ignore it.

166. Sometimes we write the specifications too tight and overprice ourselves.

167. This is one of the hardest things to do, to have verifiable, demonstratable goals. We need

guarantees of performance in field operations, not in the test programs. Explicit warranties and guarantees are tough to get in a competitive environment, and impossible to get in a sole-source contract environment. For example, in the competitive fly-off, there was relatively more willingness to share risks on fixes, ECPs, and software in the competitive stage than in the later, sole-source stage.

169. We get PMDs and PADs that leave logistics design parameters out, or are too general, or have no funds available to do it. We absolutely have the ability to write quantifiable and verifiable goals. We may not have that experience at the level of the PMD writers, or they are getting poor direction, or there is the political desire to sell the system.

176. Goals and requirements must be defined, even if they are just educated guesses. In analyses the contractor may be able to show where the goals are unreasonable or not feasible, but they need a baseline to work with. It is important to communicate our desires and have the willingness to consider alternatives.

179. We have no difficulty in specifying good R&M parameters. The difficulty lies in holding the contractors to the specifications. They have the government over a barrel unless they, the contractor, are going to be providing the support. The PMD writers put the requirements in because they have to, not because they understand them or expect to follow up. The PM knows this and he can defer logistics. The PMD should be directive on everyone. Nobody should be able to change program directions without a change to the PMD. A directive should be a directive, not a guide.

182. Enforcing the requirements is the problem. RIWs don't seem to work. We don't get our money's worth. We don't do well in sticking to our goals. There are always pressures to loosen standards, most often due to costs. AF is not a good integrater of contractors.

ASD 6. LOGISTICS DESIGN GOAL DEFINITION SOME

130. The logistics goals are quantitative enough.

171. All a part of adequate planning. There is difficulty translating parameters to contractor-achieveable goals. The contractor doesn't want to sign-up to support goals when he isn't doing the support. There is a limit to the predictability of O&S costs.

ALD 6. LOGISTICS DESIGN GOAL DEFINITION SOME

105. It is primarily a problem with the paperwork system, MIL-STDs and specifications, that are supposed to assure a good product. Application of our ILS system either overloads a contractor or allows an escape area.

127. You seldom see logistics parameters in design specifications partly due to the goal conflict that suppresses logistics concerns. To ASD the current logistics regulations are not that important. All PMDs should have at least general guidelines for the logistics program. If the PMDs have solid logistics requirements, the PM will follow. This is the way to implement Carlucci.

184. The whole acquisition community is aware of the need for supportable systems. Our most recent PMD has mostly support-oriented directives. The problem is, we're getting too specific. Goals and requirements are needed, but not to the point of decreasing flexibility.

ASD 6. LOGISTICS DESIGN GOAL DEFINITION LOW

No comments

ALD 6. LOGISTICS DESIGN GOAL DEFINITION LOW

118. Logistics goals are clearly stated, but there are no penalties for not meeting goals.

177. If the interface with engineering is properly done, everything will be okay. Contractors can design and build anything, although it may not be supportable. Success depends on the user defining his requirements and not changing them. The user must define the maintenance concept, and must make up his mind before the RFP. The maintenance concept drives most of the support like TOs, SE, facilities, training, and spares

ASD 7. TEST AND EVALUATION SIGNIFICANT

103. There is an inadequate budget for T&E, and we don't have enough T&E for supportability.

108. Budgeting is a problem, but time constraints are most significant. We can't adequately test long shelf-life items or high rated MTBF items. We must rely on paperwork studies.

117. Planning is okay, but testing is expensive and the easiest way to cut costs is to limit testing. T&E gets squeezed out by production. You have a big problem if the system has problems during testing. Also, we tend to combine test phases and not get as thorough testing.

142. Logistics aspects are always considered second.

163. How do you define tests for supportability?

174. A limited budget is the problem. We never test enough, and we're not concerned with logistic testing.

ALD 7. TEST AND EVALUATION SIGNIFICANT

118. Time constraints affect us most. The Carlucci idea of compressing acquisition times is not new, and it affects every aspect of acquisition, particularly testing.

126. Inadequate reporting of test results. We got no information on failures on the fuel control in the test program. This led to provisioning problems. We computed small quantities based on estimates. When we finally got the data, we realized the problem, but the ALC did not get the data. LSA might help, although the ORLA gave us different data for provisioning than the T&E results.

160. We can test for R&M, but we can't get enough of it. The key is, how much is enough? We need enough information to avoid the "show stoppers."

169. Performance and supportability must be tested concurrently. But "no excuse is too small to bypass support testing and TO validation." We should make the contractor validate the TOs with his recommended support equipment. Validated TOs are the secret to good support.

179. What difference does it make how soon you learn something is wrong if you can't do anything about it?

182. Logistics testing is your basic second-class citizen.

183. DT&E shortchanges supportability evaluations. They are squeezed out even if planned for. We don't get much SE evaluation or TO validation/verification.

ASD 7. TEST AND EVALUATION SOME

111. There is generally enough money for R&M testing. AFSC people will not talk to AFLC about T&E for R&M. We need acquisition logistics specialists at the test site. We test plenty, but do we test the right areas, and are we able to assess the logistics impacts of needed changes?

144. We do as much testing as the budget allows.

156. We can't get enough T&E for new programs.

171. T&E does it all the time! Without good goal definitions, this is where all the short-comings are unveiled, and it's too late to make any difference.

173. Too late to be of any significance. T&E is only a confirmation, not a planning factor. If we can't afford to fix a problem, we waive requirements, then start a modification program or a CIP.

175. Untested designs will introduce problems and delay progress in meeting the requirement. The users are very important participants in T&E.

180. It is difficult to test for supportability due to prototype equipment. No problem in off-the-shelf equipment.

ALD 7. TEST AND EVALUATION SOME

125. Logistics T&E is the most promising tool for insuring supportability, but it is the least understood. We need good T&E plans because we have the physical resources for testing. On the fighter avionics we had 150 deficiency reports before the first AF preliminary evaluation. These concerned mostly maintainability aspects, but they helped flex the logistics system early. Exercising the supply system is very useful for provisioning data. Tests after IOC are way too late.

131. Logistics T&E is primarily useful for SE.

145. There is such concurrency that T&E comes too late to show anything in time to help.

147. There is never enough money for testing, but in some of our programs we are able to get front-end testing. We can always try for more testing.

155. We can only hit the highlights. T&E is not performed in the right time frame to be effective. Results are only effective if evaluated by experienced AF technicians. The contractor engineers don't understand the field use of the equipment.

166. T&E is usually the first place to cut.

167. Demonstrations should be done by "blue suiters." Even if the DPML and the PM agree on how tests should be performed, innovative and reasonable approaches may not satisfy AFTEC or the users. They don't know what to do if the test article does not fit into the "traditional" test molds.

ASD 7. TEST AND EVALUATION LOW

106. By the time we get to testing it's too late to worry. We have to have the well-designed hardware.

113. There's never enough test to do everything.

132. Comes too late for efficient logistics operations. You need to solve the problems before you get to testing. You can't test in what's not designed-in.

133. What does supportability mean? It's hard to compare among systems. It means different things for engines, airplanes, black boxes. But, we need not be resigned to waiting for reliability growth. Systems can be intelligently designed, and we can test for many "ilities."

158. We have had excellent T&E planning.

185. Comes too late in the program to be of use.

ALD 7. TEST AND EVALUATION LOW

110. I don't know what supportability tests can be done.

124. T&E doesn't have that great an impact on logistics. By then, you are stuck with the design and the LCC is in concrete. Testing does yield failure data for provisioning, but not very good data. We haven't gotten any good failure data from testing in several years.

135. It's too late in the program to have much impact.

151. T&E is only as good as the contractor wants it to be. He can overprice any evaluation he doesn't want to see done.

ASD 8. GOAL CONFLICT SIGNIFICANT

104. It happens. In the program we wanted an air superiority fighter, and there was one goal: performance. It was designed without any logistics considerations that added time, cost, or weight. Today, LCC is "eating our lunch."

106. Short-term savings always win out in the eyes of Congress.

111. Logistics requirements are consistently subordinate to cost, schedule, and performance. There is not enough money for everything. If the PARs rated the war-fighting capability of this fighter on the basis of spares available, we would show only 40-60% capability. In the POM exercises there is a refusal to trade numbers of aircraft for needed support requirements. The needs are recognized but rationalized away, due perhaps to a lack of unanimous agreement on how to stock for spares, and the effects of the limited industrial capabilities, strategic materials, and lead times. For example, we

can accurately forecast SE delivery dates, but the lead times are large, 28 months. When we had to accelerate the site activation by 21 months, the SE was already that much late. This affected the whole ILS plan, training, TOs, etc. If we could stick to the plans, we could deliver SE 90 days prior to the need date.

112. ASD emphasis is on cost, schedule, and performance because that is what we are graded on.

115. If we want high performance systems there is no way to get them without a serious logistics problem, although most problems can be lessened by management and definition of good logistics design goals.

117. The "facts of life" are "develop the best airplane and damn the logistics." For example, the F-111 had to be lightened for the Navy, and the performance improved. Some safety features were taken out. They lightened the compressor and turbine in the engine, and the aircraft structure. That caused nightmares for maintenance.

121. The tradeoffs appeared to be heavily in favor of engine performance in the early years. The logistics and supportability problems in that program are tremendous.

122. The fighter was developed on a DTLCC basis, but most programs are not. Acquisition costs win out over support costs. The fighter program was unique in that there was "blue suit" maintenance during testing so some supportability issues were settled up front. The attack plane was handicapped by DTC.

132. This missile program has had several supportability issues traded-off for near-term cost savings. For example, a fuel that costs one-third of the price of the specified fuel could have met the engine standards, but it would have cost more to develop. It was not chosen. Every year you defer costs, the more it costs later if you change your mind.

133. It is the inherent nature of tradeoffs to favor improved performance, lower costs, and less time.

142. The goals for the program were set by the using command, and they favored performance over supportability. The logistics goals were behind the "eight ball."

142. There is a classic crunch between performance and logistics, and conflict seems inevitable.

154. Tradeoffs are driven by system performance.

159. In DT&E we don't make the tradeoffs. We are trying to sell the program to production and the emphasis is on performance. We try to weigh the impact of logistics problems that will "get you into trouble" versus the realities of having to get a program through the DSARC process. The feeling is that we will "work the logistics problems later."

162. Logistics falls out due to funding priorities. The PM is judged on cost, schedule, and performance, and not logistics. If I try to fund everything up front, there isn't enough money. There are different perspectives between the ALCs and the ALD. Changes in requirements caused many problems because the changes could have been forecasted sooner. A lack of communication confounded the problem. It was a combination of the previous PM shoving logistics aside and the infighting between ALD and the ALC. This has hurt the program.

163. ASD looks primarily at performance. Currently the feeling is not toward logistics. Logistics goals are too far-term and nebulous. The success of the PM is judged on near-term costs and performance.

172. Support is a "later" decision. The attitude is to get the system operational first, then worry about supporting it.

173. Programs are typically underfunded at the outset, and the PM cannot make investments to accommodate logistics needs. Supportability and performance are not necessarily mutually exclusive, but where logistics design may affect the performance, logistics needs will probably suffer. The glamour is in performance, and that's what the PM will be rated on.

174. There is inevitable conflict. The PM knows the logistics impacts come later, after he's gone. So he looks for short-term gains. This is bad. Staying on the job longer would help. There should be some incentive or career progression opportunity for military people who stay in one job for a long time.

181. PMs "couldn't care less" about supportability. If they have the time, they will. We aren't worried about the future. The "pats on the back" come from meeting cost, schedule, performance goals. The attitude is that whatever problems logistics has, "it won't happen on my watch." If program costs grow above limits the program is dead, so logistics goals suffer. For example, we could have made a $200K change we know would have saved millions of dollars over the life of the airplane, but if the PM bought it, he would be bankrupt this FY. You can't even consider payback when you are fiscally constrained. Multi-year procurement, with some flexibility, may allow the use of payback criterion to make decisions.

ALD 8. GOAL CONFLICT SIGNIFICANT

102. Long-term logistics concerns are generally the first to be compromised when a system gets into financial trouble. In order to meet short-term goals (system performance, lower acquisition costs), long term LCC and R&M goals are sacrificed to be addressed later. There is considerable pressure on the current PM to meet all "his" program goals at the expense of hard-to-quantify, long-term goals.

105. Although the PM is aware of D/ML logistics responsibilities, he will apply LCC goals only to the degree that they don't affect ASD program direction; that is, cost, schedule, and performance.

109. Supportability is easiest to chop from the budget.

118. Cost and performance are immediate goals, and they are managed by Congress. Our program suffers from continuous threats by Congress to cancel it. To control cost growth and help a program survive, there is a lot of "games- playing" at the Pentagon and at the OSD.

120. Cost, schedule, and performance are important to the SPO, but logistics is relegated to pseudo-importance. Front-end dollars by cost category preclude long-term expenditure decisions.

123. What we want in performance is the starting point. Consideration of logistics has improved somewhat.

125. The PM is getting his "ticket punched" on cost, schedule, and performance, which are quantifiable, measurable, and short-range. This will be the basic problem in implementing Carlucci.

126. This was very true ten years ago. Logisticians are wiser now, due to experiences like the fighter engine. There, thrust-to-weight was most important. The SPO eliminated durability fixes which would have added weight. Logistics was pushed into the background.

127. General Marsh wants PMs to "get into logistics." Previously there were no "real" conflicts; the PM

was doing all the deciding. With the requirement for the PM to report on the logistics program, conflicts may surface more and be resolved in a more equitable manner.

129. The problem is in establishing realistic goals and making rational tradeoff decisions. The PM doesn't have authority to make the funds tradeoffs. The Air Staff is unwilling to trade cost, schedule, and performance for logistics goals. On our program we had to go with ICS because of Air Staff inflexibility on program funds. The AF implementation of Carlucci will not have an impact on Air Staff decisions. Readiness groups are futile if the Air Staff is not ready to make proper tradeoff decisions.

135. As we started picking the engine, we had to slip the schedule, so we "sluffed off" logistics and decided to contract for ICS. Part of the problem was regulatory in that no provisioning can begin before production go-ahead. Logistics always plays "catch-up."

137. Logistics implications and requirements should be established early, and we must design the program around the requirements. We need to hold the PM's feet to the fire on logistics requirements. Conflict occurs because the PM's report card is based on cost, schedule, and performance. In relation to DPML authority, the DPML must be able to influence the program.

155. Politics forces fielding the system before working out the logistics aspects. It is out of the PM's control.

160. The Carlucci initiatives will be good if up-front supportability will affect the PM's report card.

164. PMs have no responsibility for support costs. They are too far in the future for them to care. It's silly not to plan for ICS, but PMs are not too interested. They get aggravated if you push them.

166. Generally in new acquisition, dollars are tight. Most consideration goes to engineering and design to get the system approved and into the field. This is probably the way it should be. Realizing that the primary mission is to defend the country, we must get the system moving.

169. The operators' desires override support concerns. Changes in mission definition cause extreme problems.

176. The intensity depends a lot on the size of the SPO. It is worse in the large SPOs. It also depends on the personal skills of the DPML. Some DPMLs can get the SPO into a position of not making a move unless logistics is involved. Tradeoffs are getting better. If there is a crunch in funds, though, some logistics requirements will suffer, like delaying SE and technical data. The SPO director only has two things to answer for: cost and schedule.

178. PMs will often try to force slippages in support requirements to force AFLC to pay later, like ICS and calibration of support equipment.

179. Neglecting early design of the support leads to ICS, meaning more money. It's all the same money, really, and there's only so much of it. Expensive support just robs future programs of R&D money. A smart R&M manager will try to design his system so well that he puts AFLC "out of business." What good is something that doesn't work? Unless the PM's report card is made on supportability, there will be no improvements. Anything that impacts schedule will have to go. Every program with not enough time or money is doomed from the start. Decreasing acquisition time is fine, but we are also decreasing front end money. The more things you put off, the more trouble you have, and the more money it costs. With a shorter acquisition cycle it is even more important to front-end support design, test, etc.

183. ASD is not accountable for supportability.

ASD 8. GOAL CONFLICT SOME

113. I was in the Pentagon when ALD was created. The criticisms of ASD favoring cost, schedule, and performance are not justified. It's a much overrated problem, and I haven't seen it.

130. The PM must trade capability needed now versus supportability needs. Bad performance, logistically speaking, is rewarded by getting the product in the field and through the initial periods of use. This is the wrong approach.

ALD 8. GOAL CONFLICT SOME

131. Tradeoffs should be based on what makes sense, not because of "party lines." But short-term goals do overcome long-term goals. For the bomber, the marching orders are to "get the rubber on the road" by 1985. It's hard to sell logistics goals that take ten years to begin payback.

177. PMs are concerned with getting the hardware out on time. They want to control this and are hesitant in confiding in logisticians. "Loggies cost money." Tight schedules are also a factor. It is almost impossible to develop good TOs on an accelerated schedule.

ASD 8. GOAL CONFLICT LOW

143. Goals come from users or higher-ups. They're not decided here.

171. The PM responds to Congress, not the user. It is difficult to make it any other way.

ALD 8. GOAL CONFLICT LOW

119. There isn't the problem in the development phase. Picking the priority goal to work on may be a problem.

138. No problem. PM "types" make all the decisions to meet their objectives.

139. The logistics goal is to satisfy the PM.

145. I haven't seen the problem in this program.

147. We won't ever get totally [illegible] system tradeoffs in favor of the present.

150. There's no problem with tradeoffs in a production program.

184. Contractors need to get moving on designing support, TOs, etc. Their attitude is to get the system out first, then get the support out later.

ASD OTHERS SIGNIFICANT

103. Overall program funding is most important.

104. Limited budgets are the primary problem. Up-front money is lacking, and costs balloon in later years.

112. Program funding. Logistics support elements are secondary and get cut first.

113. In modification programs, we are buying the hardware packages, but ALCs control the modification accounts. The bureaucracy associated with spares requirements computations could be significant. Perhaps AFSC should control the funds, but PMs are not familiar with logistics ways. The change in management may be needed if modification programs get more popular.

122. We need "blue suit" involvement with hardware as early as possible in the test programs. AFTEC sees itself as a "checker." They should be more concerned with bringing in AF people to use the aircraft. The contractor can't envision the operations role of the systems as well.

130. The way contracts are written. There are no incentives for good designs for support. There is no appreciation of the needs of logistics. The integrity of the contractor is a factor. They are concerned with delivering the right quantities on time, but without the quality. They apply for quality waivers and get them. The "high-level guys," military and industry, want to meet time schedules. ASD procurement contracts are written with a strong "hammer", but there is no parallel in logistics contracts. Past logistics performance should be a factor in new contract awards. Contractors are reacting to the emphasis placed by AF and the Congress on acquisition cost.

136. Changes in funding, schedules, and program direction from legislative levels without considering the lead times involved.

154. Late direction via the PMDs, and poor planning. Development specifications should be "hit hard" at the design reviews, to see if they still retain the overall requirements.

162. Most havoc is caused from instability in funding. Allotments have bounced around greatly, causing great undulations in program planning. Program compression has caused many of the problems. Concurrency doesn't allow enough time for testing long lead-time items, and late changes to the system. Delayed decisions on ALC versus contractor support is causing chaos.

163. Overall budget constraints. With set performance requirements, leftover money can go to supportability issues that were previously pushed back.

170. The resources for logistics. For the fighter, the AF decided not to buy the spares and to accept the NMCS rates. This is outside the control of the PM. The other factors you list are insignificant compared to the "logistics resources."

ALD OTHERS SIGNIFICANT

107. Reprocurement data is almost never accurate. Engineering changes are rarely updated in the repository. We need to get smart on buying reprocurement rights. Also, procurement rules prevent carrying the best design to final selection among competing contractors. We are not permitted to share good ideas from one contractor to another. This is especially true for DTC small programs procured under FFP contracts.

118. Overall funding. The attitudes of the PM are driven by emphasis given by Congress and the OSD. There is a structural fault in congressional meddling, trying to run our programs.

125. DPMLs are not given clear guidance on what their job is. I know no DPML whose job is specifically defined by the PM. AFLC/AFSC Pamphlet 800-34 is no good for guidance. PMs and SMs have no clear idea of what a DPML is supposed to do, and I include AFALD/SD. They are not looking out for the DPML. He is basically on his own.

131. Overall program funding. In the logistics world, this puts caps on SE and spares. DTC is a particularly limiting factor.

137. Early involvement by the logistics community is of paramount importance. The second guy in the SPO should be the logistician. This will resolve many of the problems. It worked in the C-X program.

138. This fighter program is so big, it "steamrolls" management. The contractor is calling the shots, and he always gets his way on CDRLs, for example. The contractor is managing us, and the logistics needs suffer. We also get hung up in sole-source procurement due in part to problems in reprocurement rights. The contractor's pricing policies can inhibit reprocurement clauses in contracts. There are possible big LCC savings potential in competitive reprocurement for spares.

141. The acquisition business needs some creativity. There is a perception in AFLC that the SPO controls everything, and they want SPO people to authorize every move.

145. Indecision in the program at the higher levels. It is difficult to plan anything in the face of program changes. There are so many people working in logistics that some information, like requirements, are lost in translation through all the offices. The new start Decision Tree Analysis at AFLC, which helps decide whether support will be organic or contractor, takes too long. Our results won't arrive for a year. Consequently, this program has no depot maintenance planning.

148. Overall funding. The SPO must realize what all the funding obligations and liabilities are so they are better aware of the budget requirements. For example, the PM needs to consider simulators, SE, ICS, training, etc. in making his budget estimates. The big SPOs are forced to rely on contractor estimates. In small SPOs we are more aware of all the costs of procuring a system and its support.

153. Contractors do not agree with the AF on such things as warranties. Tracking operating time for warranted items is a problem, such as on LRUs, which do not accrue time by flying hours. If we are pushing the state of the art, we should plan for CIP rather than pay for warranties. Another problem is that SE procurement is not centralized. We have no good way of determining if we have common SE in use that will work with new systems. We have the same problem with GFE. We are not able to take advantage of standardization and other proven ways to cut costs.

155. Need to front-load money for programs. MYP will help. Also, supportability and performance is directly related to the integrity and the experience of the contractor.

176. We have a problem in screening for common support items, which is done by the ALC. We have to take their word for it, but we don't think they are very thorough. We often waste money by not designing hardware that can use common SE, such as tow bars. Contract processing times are a factor in schedule constraints. Sole-source contracts are frequently used to expedite schedules, but the costs double. AFLC should have money for data items, independent of the SPO funds. Often we need types of data the SPO either doesn't understand or won't pay for, such as MIL-STD TOs instead of commercial handbooks.

177. SE design must be concurrent with system design. We need to use more common SE. But just like they want "new" planes, people want "new" SE. There is a handbook for SE design, but it appears to be ignored. Waivers are applied for by the contractor, and they are usually granted to meet schedules.

178. There is an "unawareness" in the DPMLs on the rules of the (logistics) game. 800-34 is a good book for the "new loggie", and for the PM. I advocate a "cookbook" approach to ILS.

179. Funding for logistics and the congressional budget process. We shouldn't look at money as coming from separate pots. ICS should be used only if SE is late in being delivered. To "plan" for ICS is a travesty. But, ICS is attractive to the PM because AFLC pays for it. Too many "blue suiters" look at the job from a small-scale perspective. They can't see what's best for the AF. The average civilian looks at the job from a less "personal" point of view. I would hate to go to war with the short-sighted way we buy systems. There is too much "peace time" thinking. We should think about fighting a war.

183. Concurrency drives us to less T&E, goal conflict increases, and changes become impossible. The acquisition cycle should be shortened by using evolutionary designs rather than revolutionary ones.

ASD COMMENTS

100. The factors inhibiting ILS depend on the phase of the prograr.

106. This organization is different. Until recently we were a jointly managed ALD/ASD program office.

132. The DCS/AL is a good first step to establish some generic identification with logistics issues at HQAFSC. This will help short circuit the long process up the AFLC chain.

133. Factors depend on the phase of the program.

170. General Marsh is saying that everything to do with the program is the PM's responsibility. The DCS/AL is just bringing logistics "closer to the vest." They are trying to get away from the attitude that "those are logistics command problems."

ALD COMMENTS

102. Goal conflict, organizational structure, and DPML authority center on the priority given logistics concerns during FSD. These are generally out of the control of the people who try to implement logistics concerns. The other factors are controllable at the working level, and thus have a lower impact.

109. There are two ways to look at the problems with respect to ILS. One, with new acquisition programs, and two, after logistics management responsibility transfer, LMRT.

118. The DCS/AL MOA says AFSC will be responsible for funding ICS. This is good because AFSC traditionally uses ICS funded by AFLC to cover some squares they are responsible for.

125. The DCS/AL MOA is worrisome. We have had independence in ALD. The separate reporting chain will disappear, and the PM will be reporting logistics supportability. ALD has attracted good people in the past, but there is no career path for logistics skills in AFSC. This systemic problem will deter good people from acquisition logistics.

126. We saw a transition in ASD during the 70's from almost no concern about logistics to some emphasis in the face of cost, schedule, and performance constraints. We in ALD learned to be leery of new proposals which ignored logistics aspects, and I think we contributed to the renewed emphasis.

127. The DCS/AL will be good for us. We will start to see some consistency in logistics decisions vis-a-vis program decisions. The technical director should be from AFALD.

131. My answers to your questions would differ depending on what phase I was in.

153. The DCS/AL MOA says the PM has logistics responsibility. General Marsh seems to be taking this seriously. Other product divisions already have Deputy for Acquisition Logistics offices. ASD is the only one that does not.

160. Concerning the DCS/AL, if the DPML is subservient to the PM, and there is no other channel for him to go through, you have made an incestuous relationship. ALD must survive, otherwise it makes no sense.

177. The DCS/AL will not work if all personnel are systems command oriented. Just like the PM they will perform to the expectations of AFSC, if that is the judging criteria.The DCS/AL should be demanding standardization in SE to stop proliferation.

184. The DCS/AL changes are for the good, an emphasis on logistics. If the PM is rated on his responsibilities, that is, support, we don't need a dual chain as provided by ALD. The current way of rating supportability is subjective. The PM still needs the advice and input from AFLC, so we should retain some type of interface function.

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